SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

THE SCOTCH IRON TRADE—No. XIII.

THE BLOCHAIRN IRONWORKS.

As a relief to the sketches which we have up till the present time published on the pig ironworks, we propose this week to take up one of the largest and most famous malleable ironworks in Scotland. The Blochairn Ironworks are situated to the north-east of Glasgow, from which they are distant about two miles. Established about 22 years ago, they have since then been doubled in size, and more than trebled in their power of production. Originally they turned out about 350 tons of iron per week, but at the present time they turn out fully 1100 to 1200 tons of finished iron weekly, and but for the fact that some of the furnaces are out of order they would be equal to a still larger production. The works have direct connection with the Caledonian Railway, and also with the Monkland Canal, which runs through their site. They are thus well provided with the most essential element in the success of a large manufacturing establishment—adequate means of transport. As originally designed, the Blochairn Works comprised a puddling shed 300 ft. in length, by 250 ft. broad, bound with iron on all sides and covered with slates, thus securing, by the almost entire absence of combustible material, immunity from the dangers of fire. The furnaces were increased in number from time to time, until in the portion now known as the old works—in contradistinction to the department embracing Siemens' puddling-furnaces, which has been added within the last two years—there are 34 single and 8 double puddling furnaces, in addition to 14 heating and scrap furnaces. Among other essential appliances this department includes a 22-in. plate mill, a 28-in. mill, and a combined 16-in. and 12-in. mill, worked by the use of two different sets of pinions. There are also two forge trains—one of them 20 in. and the other 18 in., for rolling puddled bars, and an 8-in. guide mill. Two beam-engines, each of 120-horse power, 4-ft. cylinder, and 6-ft. stroke, and a pair of horizontal engines of 60-horse power combined supply motive power to the whole of the machinery in this department, except as regards one or two isolated tools which have donkey-engines attached for their own special use. Attached to the horizontal engines—which have cylinders 22 in. diameter, and 3 ft. 6 in. stroke—there are two vertical boilers, the steam of which is generated in part by the spare heat from the furnaces. Attached to the larger engines there are nine horizontal duplex boilers, 30 ft. long, and 7 ft. 6 in. in diameter, with two fires each. The latter, we may state, show one of the latest adaptations of the Cornish boiler, the smoke being consumed by meeting the heated gas at a given point. Immediately to the west of the older department a large addition has lately been made to the Blochairn Works, by which they have been more than doubled in size. These extensive addenda comprise 24 double puddling, or 48 single puddling furnaces, the productive power of which has not yet been fairly estimated. They are all built on Mr. Siemens' patent regenerative gas principle, being the first application of Mr. Siemens' patent on anything like a large scale in Scotland; and they were erected under the supervision of Mr. Healey, the patentee's representative in Scotland. In addition to these furnaces there have to be included in the new department a large forge train, or puddling mill, two 26-in. plate mills, and one 20-in. plate mill. The two 26 in. mills are supplied with power by a horizontal engine of 200-horse power, 3 ft. 6 in. cylinder, and 5-ft. stroke. The 22-in. plate mill, and the 20-in. bar mill, are worked by a pair of engines of like construction, 3-ft. cylinder, and 4-ft. stroke. Gear wheels, and Stevenson's patent reversing apparatus are attached to all the mills, making them capable of being reversed at a higher speed than has yet been attained by any other plan. Hitherto the common mode of reversing has been by five spur wheels, two of which were on the same axle, and run in opposite directions. To each of these wheels a claw clutch was attached, the claws being placed in opposite directions, and into them being moved alternately a clutch which slid upon feathers fixed to the main shaft. The centre clutch was moved into either of the side clutches before the plate or bar was allowed to enter the rollers, and at the time of the clutch thus entering, the side ones moved at full speed, while the centre clutch and the rollers remained stationary. This appliance, however, had the great drawback, that by throwing in the clutch while the wheels were at full speed a tremendous shock was given to the whole gearing, reducing it frequently to splinters, and entailing a great loss of both time and money. By Mr. Stevenson's plan, however, as introduced at Blochairn, the mill can be instantly reversed without jarring, and with greatly diminished risk of breakage, even when going at the greatest attainable speed. The same appliance is in use at the works of the Monkland Steel and Iron Company, which we have already described in these columns. The principle of Mr. Stevenson's patent is similar to that of working an ordinary crane, the main difference being that whereas the pressure is taken off to stop the motion of the crane, the pressure is in this case put on to carry the drum round with the driver. The apparatus for generating the gas at the Blochairn Works is situated on the other side of the Monkland Canal, and consists of 98 producers, from which pipes lead to two large rectangular wrought-iron tubes, 7 ft. by 4 ft. in section, and is thereby conveyed across the canal at an elevation sufficiently high to allow of the passage of vessels underneath. A bridge 9 ft. in width connects the different parts of the works on either side of the canal. On this bridge a permanent set of rails is laid down for the purpose of carrying across material necessary to be used in the gas producers and boilers, and taking away the waste material. Fourteen large horizontal boilers supply steam for the machinery in the new works. These boilers are fitted with Galloway's tubes, and represent an aggregate of 1000-horse power. The puddled bar is cut up with three strong oscillating shears, each provided with a double blade. Another shears, capable of cutting a plate 10 ft. 6 in. long, and 7 ft. 6 in. of 1½-in. cold iron, has recently been added. The latter has an engine of 20-horse power for its own special use. The whole of the works are covered in by a handsome series of iron sheds, supported on girders of exceptional strength, so that they can stand any amount of wind.

Pig-Iron in the North of England.—The continued large consumption at home of the pig-iron produced in this country is conspicuous. During May last year 164,082 tons of pig were produced in the district now within the trade legislation of the Cleveland Ironmasters' Association. During May this year there has been a larger quantity produced in the same district by 4713 tons, whilst the increase of May this year over April is 5387 tons. This has taken place at the same time that the quantity shipped from the port of Middlesborough, either to foreign countries or coastwise, has been a decrease in May this year over the corresponding month in 1871 of no less than 4235 tons, simultaneously with a continued decrease in makers' stocks of 933 tons in May, as compared with April, and 260 tons decrease in the warrant stores in the same month. How much of this large quantity available for the purpose was consumed in the 1990 puddling-furnaces in the North of England, and in numerous foundries there, and how much was passed on to the mills and forges and the foundries in other parts of England, we are unable to say, but it is clear that, notwithstanding the very pressing demand for pig-iron now made upon the proprietors of blast-furnaces in this country, they find it more to their profit to keep it at home, and to manipulate the finished article here, than to send it abroad. We are inclined to believe that the great bulk of the increase was used up within a few miles of the blast-furnaces, out of which in the Cleveland Iron Association district 168,795 tons were run last month, for it is notorious that certain of the old districts experience a difficulty in getting all the iron they require, and indeed that they have bought, from Cleveland.

THE FIRE OF TORBANEHILL MINERAL.

Sir,—The fire of the Torbanehill mineral has had universal attention directed to it since the news was bruited abroad on Monday last, 3d. inst. There is not a shadow of a doubt that the fire was the work of an incendiary, and that the incendiary must have been animated with no common motives. The person who planned this dastard and dangerous deed must have taken the greatest pains to secure his purpose. It is one of the most difficult things to set fire to this Torbanehill mineral, unless by the agency of a previously existing fire; but using such instrumentality efficiently, the Torbanehill mineral may be lighted up easily, and the flames will be always exceedingly difficult of extinguishment. There is little doubt that the immediate operator—the instrument of the brain in the background—must have taken with him, up to the top of the immense heap where the fire began, a good supply of paraffin oil, or other imflammable substance capable of transferring its own ignition to the blocks around.

The next reflection is that, seeing there must have been a greatly daring instrument working at the will and suggestions of a clever headpiece behind, it is very evident that the common hum-drum appliances of county policemen will utterly fail to discover the perpetrator. Even ordinary procurator-fiscals will be quite powerless in finding out the immediate agent and the author of so diabolical a deed. But should one or two—perhaps one may suffice—of the ablest detectives in Great Britain be employed they, or he, will assuredly be able to come upon the perpetrators,

Whatever was the motive urging on the monster who set fire to this mountain of oleaginous material—and he must have been urged on by motives truly infernal—an object which that Providence which is generally allowed (at least not denied) to overrule the affairs of mankind had in view may be assigned with a high approach to accuracy. The immediate heap which burst out in flames early on Monday morning was the last heap of the Torbanehill mineral remaining on the grounds, and it was in course of being transported elsewhere. Thus, the Torbanehill mineral, as on Torbanehill lands, was on the point of vanishment. Shall there be no evidence given to the world, ere it be to late, of the real nature of the mineral in question? Yes, a patent and unmistakeable evidence—undeniable also—shall be given, whereby it shall be seen and read of all men what are the actual characteristics of this mineral, or, in other words to what category of mineral substances it truly belongs. The facts are that the mineral is on fire, the fire is large, and simultaneously "rivers of oil" flow down from every part of the burning mass, ditches and pits and holes of all kinds are suddenly extemporised, and the boiling and ill-smelling liquid is arrested in its flow and caught in these hastily-made receptacles, from whence it is carried away in tubs and barrows of all kinds, suddenly collected to save what can be saved of so valuable a fluid.

Now, after this fire there is not a man in Britain who will be able to remain blind as to one important fact. Hereafter no one will be, unless willingly, so wooden-headed, and so stoney-hearted, and hard-hearted (hard as the nether millstone) as to be able to maintain, in respectable society, that this mineral required a patent process to bring out from it—in a secret chemical work—the oil of which it is made up, to the extent of three-fourths against its fourth of base.

In the next place, so soon as this unparalleled fire shall be completely extinguished, men from all quarters will be able to satisfy themselves as to the real constitution of the base of this mineral. They will see before them only heaps of calcined pipe-clay, except where the discharges from the fire-engines may have partially taken away the whiteness. In any event, the spectators will see where the oil had heen all expelled, only pieces of pure clay-silicate of alumina—that, and nothing else..

Whoever heard of coal yielding oil in this fashion? Whoever heard of coal that yielded only a residum of clay without one atom of cinder or true coke? In the time to come this experiment on so vast a scale (utterly opposed to the secrets of laboratories or privately conducted experiments) will tell to every man with a head to perceive and a heart not incapable of giving expression to the perceptions—will be able, I say, to speak out without dubiety as to what this Torbanehill mineral is not.

But I must draw to a conclusion with my reflections regarding this fire and this mineral—which in itself is a physical marvel, and almost a miracle. A base of clay=¼, and a resident quantity of purely oleaginous matter=¾, is as near as may be a standing miracle of Nature's. Much paraffin oil is still made in Scotland—mainly, if not exclusively, in the Torbanehill district—but all the oil comes from admitted shales, and these shales differ from the Torbanehill mineral in no other respect than this, that they yield less oil, which is attached to a base of much more clay. In fact, the proportions of the constituents are simply reversed, being about one-fourth oil, or less, to three-fourths clay, or more. The parties who became half millionaires by calling the Torbanehill mineral coal, admit now that they operate upon shales—shales only, in order to get their present supply of paraffin oil. The definition given the other day by your contemporary, the *Scotsman*, is right, This mineral is neither coal nor shale. It is a new mineral, and as it was new at its discovery, so it is likely to continue unique so long as mining operations shall last. Finally, as classic antiquity knew of a man inordinately ambitious of fame with posterity, who, to secure his object, threw himself into one of the two burning mountains of Italia, so the man who did this atrocious deed will have a burning mountain cast over him while the records of monstrous crimes shall be to the fore. As soon as he is discovered the execrations of civilised mankind will be heaped upon his head. Some motives of revenge there must have been in the direful deed; but the heavens are just, and he who will injure ultimately only the innocent shareholders of so many insurance offices (a fact which the perpetrator could not have known) will be a mark for the vengeance of heaven, through the medium of an earthly punishment for the rest of his days, and for the execration of mankind through the all-hail hereafter. Wm. Gillespie.

Melville-street, Edinburgh.

THE MINES OF UTAH.

Sir,—The principal theme of conversation between the capitalists and business men of the West, in fact, the one absorbing topic of the day, is the great mines of Utah, their immense resources, and future development. And the excitement is not confined to the West, nor to our own country, but has penetrated beyond the Atlantic, and is engaging the attention of many eminent financiers of Europe, who seem to think the subject worthy of the closest investigation. And as Great Britain seems specially interested, perhaps a general summary of the leading districts, and the principal mines in each, might prove of benefit to your readers, more especially to those who may contemplate following the example of many English capitalists, who have already invested such large amounts in these rich western mountains. It has been asserted by those whose experience in such matters qualifies them to be competent judges that there is no place on this continent, if on any other, which promises so sure, speedy, and permanent return for capital invested than these mineral hills, whose wealth is boundless and inexhaustible. It is almost impossible for a person who has never been in this section of the country, and visited the mineral districts, to form a just estimate of their immense resources; in fact, it is something which requires to be seen in order to be appreciated or understood. The most elaborate and minute description would scarcely convey more than an idea of their real vastness, and though such an account might appear exaggerated to the casual reader, yet one who knew the truth by actual observation would say the description was far below the reality, and that the story was not half told. And new discoveries are continually being made whose wonderful richness causes the oldest and most experienced miners to open their eyes in astonishment, and which tend to prove conclusively that mining in Utah will not be a mere temporary excitement, but is destined to become a branch of industry as lucrative as it will be permanent.

In a brief article like the present it would be impossible to do adequate justice to all the mines which are worthy of notice, or even to give a proper description of every district; however, I will try to be as comprehensive as possible, and endeavour not to sacrifice necessary clearness to simple brevity. In many cases I might pertinently devote the entire space designed for this communication to one district, and in some instances to one particular mine, but my object is to give a general synopsis of what has been accomplished in all of the principal districts, and the names of those mines which are the best developed, as well as those which are the most promising. As far as space permits, I will particularise in regard to those whose merits are most firmly established; with reference to the others, necessity compels me to be more cursory.

By referring to Froiseth's new Mining and Sectional Maps of Utah, I find 47 regularly organised mining districts in the Territory, the greater number of which have been organised during the past year. Their names are as follows—Logan, Millville, Mineral Point, Dry Lake, Willow Creek, Weber, Centreville, Hot Springs, New Eldorado, Big Cottonwood, Little Cottonwood, American Fork, Silver Lake, Uintah, Snake, Howland, West Mountain, Tovele, Stockton, Ophir, Lower, Camp Floyd, Osceola, Pelican, Lake Side, Desert, Columbia, West Tintic, North Tintic, East Tintic, Utah, Cook, Spanish Fork, Mount Nebo or Timmins, Fremont and Church Islands in Great Salt Lake, Deep Creek, Good Indian Springs, Canal, Washington, Star, Lincoln, Granite, Beaver, Ohio, Warsaw, and Silver Bell. In many of these districts work has been suspended during the entire winter on account of severe weather, and the mines have been obliged to lie quietly under the deep snow until the advent of spring, while in others work has been vigorously prosecuted notwithstanding the weather. In the Cottonwoods the snow has fallen continuously for 10 or 15 days, almost at regular intervals, thereby causing occasional snow-slides, and yet in spite of these serious drawbacks a great deal has been accomplished in the way of development. Large bodies of ores have been taken out from different mines; tunnel companies have been formed with immense amounts of capital, one of which is in successful operation. The mines are looking finely, especially those in the vicinity of Emma Hill, and their owners anticipate that many of them when sufficiently developed will turn out equal to the celebrated Emma, which has been termed, and not unjustly, the most extraordinary mine in the world. Some people affect to believe that the future wealth of the Cottonwoods is beyond calculation, and predict that five or ten years hence their value will be better understood than at the present day. However this may be, they are certainly promising enough to anticipate brilliant results in the future.

In American Fork district work has also been carried on during the severe weather. The Sultana Smelting Company, who own the celebrated Miller Mine, have erected two furnaces at a place called Forest City, and also a tramway between the mine and the furnaces for the purpose of transporting the ore. This company has recently let a contract for a narrow gauge railway from their works to American Fork City, a distance of 22 miles. This narrow gauge is to connect with the Utah Southern Railroad, and will be in running order by August 1, which will greatly enhance the value of all mines in this district.

Camp Floyd is now one of the most promising districts in the Territory, and cannot fail to maintain the popularity which it has so justly earned during the past season. It possesses a great advantage over many other districts in being so situated as to be comparatively little influenced by the weather, thereby permitting work to be prosecuted at all seasons of the year. The mineowners in this

camp have a very high opinion of their property, which opinion is based upon real merit, and they have shown a remarkable degree of enterprise in developing the same. New prospects have been opened, and the older locations worked vigorously, new shafts have been sunk, and old ones deepened; in fact, everything has been done that mining enterprise could suggest to render this camp both thriving and popular. The Camp Floyd Silver Mining Company have nearly completed a large quartz mill, under the able management of Capt. E. H. Shaw, and will soon construct a tramway from the mill to the mines. Parties who have lately purchased the Silver Circle Mine have also bought a mill site, where it is proposed to erect another mill. It is anticipated that many of the mines in this district will be sold at very high prices during the coming season.

Work has also been continued during the winter in the West Mountain district, which has become noted by the discovery of very rich silver ore in Butterfield Canon. These new discoveries are reported to be very wonderful, and are attracting prospectors from all quarters. The Bingham Gold Mines, in this district, are also expected to yield largely this season, as in many instances the miners are supplied with hydraulic machinery. In Stockton district H. S. Jacobs and Co. are erecting three stack furnaces for the reduction of the ore. Two are to be kept continually in running order, and it is expected they will produce 40 tons of bullion per day. The same company have purchased the steamer City of Corinne, which will run in connection with the works from Lake Side to Corinne, from whence there is communication both east and west by the Union Pacific and Central Pacific Railroads. The prospects in Ophir district are unusually bright this spring. The successful establishment of the Pioneer Mills in East Canon, by Walker Brothers, and the opening of a market for ores at Reno prices, have imparted new life to the entire district. A number of the miners are preparing to start arastras, which, added to the mill, will make a yield of bullion sufficient to place the miners all on their feet, and impart a degree of popularity to the camp which it has never before enjoyed. The miners have been at work during the greater part of the winter, and have opened many valuable mines, which are now ready for the market. Work is also progressing very favourably in East Tintic, and capitalists seem to be taking a lively interest in this district. The Eureka Company are erecting a 12-stamp mill at Homansville, Wm. D. and Oliver Huntingdon are running a tunnel on the Black Dragon lode, and the Salt Lake Mining Company are tunnelling Argenta Hill with considerable success. Fresh discoveries of rich horn silver rock have recently been made on Eureka Hill, and the mines near Silver and Diamond cities are steadily increasing in value. It takes time and money to open quartz mines, and this district has laboured under the disadvantages often incidental to new mining districts, more especially that of lack of capital. But time will remove all obstacles, and show the true value and capabilities of Tintic.

A very few months ago the southern portion of the Territory was comparatively little known as a mining region; several districts had been located, but little or no enthusiasm was manifested about them, But every day brings forth evidence that these districts are equal to any in the country. The Star district especially has caused a wonderful excitement, which does not abate in the least, as new discoveries are constantly being made, each one more marvellous than the last. The district proper comprises North, South, East, and West Star, and embraces an area of 10 miles, and is about 200 miles distant from Salt Lake City. The miners in this locality have termed Star district the "treasure house of the nation," and affirm that nowhere in the history of silver mining have such prospects been seen or heard of as are presented in this district. It is confidently expected that this region will attract a large amount of capital during the present season, perhaps more than will be invested in any other one district in the country. Wherever capital has been judiciously invested in our silver mines the returns have been great, and it has been proved conclusively that the mines improve so vastly by proper development as to warrant the outlay of very large amounts of capital, but as an old miner pertinently remarked, "be the tree ever so good, we cannot get a board unless we invest in the machinery to get the board out of the tree."

The following is a classified list of the best known mines in the principal mining districts, with, in some instances, the quality of the ores, the depth of shaft already sunk, and the general character of the mine in brief:—

Little Cottonwood District.—Emma, galena ores, sulphurets, carbonates, and oxides of lead carrying silver; Flagstaff, Montezuma, North Star, Davenport, Wandering Boy, Savage, South Star, Relief, and Frederick, all good mines of argentiferous galena, and developing finely. Dexter lode, situated on Emma Hill, tunnel 50 ft., shaft 63 ft., showing a fine body of ore.

Big Cottonwood District.—Reed and Benson, Highland Chief, Prince of Wales, Wellington, Cooper, Richmond, and Miller, of a similar character to those in Little Cottonwood.

American Fork District.—Mary Ellen, three shafts, argentiferous galena, bearing gold, silver, and lead; Live Yankee, continuation of the Mary Ellen, similar character, both first-class mines and well developed; Miller produces immense bodies of ore; Pittsburg, Pioneer, Queen of the West, King Pin, Badger, Silver Glance, Lexington, and Silveropolis, all argentiferous galena.

West Mountain District (Bingham Canon).—Osceola, Winnamuck, Yosemite, Bullion, Orphan Boy, Spanish, Vesperian, silver and gold-bearing quartz; Saturn, shaft 80 ft., tunnel 125 ft., cutting the vein 115 ft. from surface, contains fine bodies of ore, which steadily increase as they go down; Mineral Hill, Miners' Hope, and Ashland. (Butterfield Canon.)—Lucky Boy, Black Jack, Empire, Eagle Bird, Southern Spy, and Old Times, all good locations,

Stockton, or Rush Valley District.—Kearsearge, Ira, Paul Pry, Fourth of July, Jenny, Azure Queen, Monmouth, Gen. Connor, Silver King, Metropolitan, Grand Cross, Great Britain, Legal Tender, and Josephine, generally low grade ores, but lack of quality made up in quantity, the leads unusually wide and easy to work, involving comparatively small cost.

Ophir District (Dry Canon).—Alabama, Dry Pine, Balsam, Snowstorm, Chance, Washington, Argenta, and McCall. (East Canon.)—Hidden Treasure, Silver Shield, San Joaquim, Silver Chief, Mountain Tiger, Mountain Lion, Zella, Hard to Beat, Gen. Grant, Sunnyside, Chloride Queen, Green Chloride, Hattie Evans, Nabob, and Sweet Water.

Camp Floyd District—Sparrow Hawk (the "Emma" of Camp Floyd) employs 80 men, turning out ore from five places, immense deposits of rich sulphurets of silver and horn silver; Last Chance and Marion, milling quartz and sulphurets ores; Gen. Morrow, shaft 53 ft. deep, immense outcroppings, very good mine; Camp Douglas, shaft 47 ft., besides a drift of 5 ft., large bodies of ore, no better mine in the district. Peerless, Bismarck, Elk Horn, Antelope, Red Eagle, Grecian Bend, Silver Circle, Star of the West, Sheba, Delaware, similar formation to the Sparrow Hawk; American, True Delta, and Silver Cloud, well appearing and very promising mines.

Columbia District.—Gold Eagle, Valley Tan, Utah Chief, Washington, St. Lawrence, Chimney Corner, Left Bower, Liberal, Argenta, Mammoth, and Lake View, ore bearing silver and lead, wood and water abundant.

Silver Lake District.—About 250 locations made.

Hot Spring District.—About 40 locations made; ores all bear gold and silver, and one location, a military reservation, shows quicksilver.

Ohio District.—Daniel Webster, Bully Boy, Great Western, Golden Curry, Springtown, Senate, and Yankee Blade.

Silver Bell District.—Emma, May Flower, Flagtaff, Sombrero, Income, Wm. Mann, Silver Glance, and Crawford.

Lincoln District.—Rolling, Wahsatch, United States, Quincy, Coral Reef, Dayton, and Creole.

Granite District.—The great Bismuth Mine, said to be the only mine of its description and magnitude in the country.

East Tintic District.—Black Dragon, Saratoga, Mary Cleveland, the last two showing splendidly; Swansea, which is shipping more ore than ever; Mammoth (working 40 men), Montana and Red Bird, producing fine ore; Sunbeam, Galena Bed, Greenleaf, Alice, Maggie, Rio del Norte, Washington, Benton, Morning Glory, and Silver Pride, all showing good prospects.

Star District.—Shenandoah, Temperance, and Copper Glance, first-class mines, yielding large quantities of high grade ore; Clipper and Last Chance, very well developed; Independence, London, Liverpool, Pitney, Ruby, Maxwell, Big Mormon, Lookout, Taylor, Jupiter, St. Mary, Midas, Champion, Amsterdam, Harrington, New Hope, and Gen. Washington, good locations, high grade ores in which silver predominates.

A number of business men and capitalists have organised, in Salt Lake City, an "American Bureau of Mining Information for Utah," for the purpose of collecting authentic information and statistics relative to mining property throughout the Territory. This Bureau solicits from miners and mine owners all kinds of information relating to mines and furnaces, which will be published in the "Bulletin of the Bureau," and distributed at all Mining and Stock Boards throughout the United States and Europe. Salt Lake City cannot help but be the mining centre of the Territory, as it is situated at a convenient distance, and surrounded by a cordon of mining localities whose wealth has already gained a world-wide celebrity. And, in addition to those which are known at present, no doubt other rich districts remain yet undiscovered, which will be unearthed in due time, all of which must necessarily pay tribute to one common centre, and that centre in the very fitness of things is and must be Salt Lake City.—*Salt Lake City, Utah Territory May* 18. B. A. M. F.

THE MINING BUREAU—BRANCH IN UTAH.

SIR,—Since I gave my consent to act as manager of the Utah branch of the Mining Bureau of the Pacific Coast, established in California by Col. J. Berton, Vice-Consul of France at Sacramento, I have received letters of enquiry from parties in England, and elsewhere, who now own, or who desire to become owners of, or interested in, mines in the Territory. Permit me, therefore, to say to the readers of the *Mining Journal*, and all parties interested, that the Utah branch of the Mining Bureau is intended to be, as is the Bureau itself, a source of correct and reliable information concerning Utah mining property introduced, or intended to be introduced, on European as well as American markets. The fact that the Territory abounds in mines of wonderful richness has of late created such an excitement among all classes of speculators here and abroad that there seems to be a serious danger that attempts will be made by unscrupulous operators to place spurious schemes on foreign as well as domestic markets. Such attempts, if successful, would seriously injure the mining interests of this Territory, and lessen the confidence of capitalists in the same, and would delay for many years the development of our mineral resources. In order, therefore, to check any movement of that kind, and with a view to protect foreign as well as American investors, I considered it to be my duty, as Governor of Utah, to accept the management of the branch of the Mining Bureau as established lately in this city.

Arrangements have been made in conjunction with Col. Berton, President of the Bureau, to have any Utah mining property which may be referred to us for investigation examined by a competent engineer, under the supervision and in presence of Col. Berton or myself. Reports thereon shall be approved and certified under the seal of this office with the signatures of both of us. The most careful and complete attention will be paid to the titles of mining claims, the investigation of which will be made by an able and practical land-lawyer, and a full record of titles will accompany each report on any mining property referred to us for final examination. Such record shall be certified by the Secretary of this Territory, the Hon. Geo. A. Black, who has been appointed secretary of the Branch Mining Bureau. GEO. L. WOODS, Governor, Utah Territory.

Executive Department, Salt Lake City, Utah Territory, May 18.

MINING TRANSACTIONS ON THE PACIFIC COAST.

THE FLAGSTAFF MINE, UTAH.

SIR,—The organised campaign against some of the leading mines in this Territory, now on the London market, has just been inaugurated in the opening of the case against the Flagstaff Mining Company, brought before Judge O. F. Strickland, of the United States' Court. At the request of some interested parties in England, and in consequence of the importance of this case, the solution of which will necessarily exercise a considerable influence on the future mining transactions in Utah, I felt it my duty, as President of the Mining Bureau of the Pacific Coast, to proceed to Salt Lake City, in order to attend the proceedings of the Court, and make such enquiries as will be of benefit to foreign shareholders. I had several interviews with attorneys and counsel of both sides, who kindly furnished me with all information which I desired to obtain.

Governor Woods, who is assisting counsel for the plaintiffs, is the manager of the Utah branch of the Mining Bureau. Under the present circumstances, I am authorised to state that, while he is Governor of the Territory and at the same time manager of the branch Bureau, it should not be inferred that he intends to extend to the plaintiffs the authority of his official position or the influence of his connection with the Mining Bureau; he is a lawyer by profession, and as such has the right under the Statute to practise law in Utah. He is, therefore, acting in the present case in his private capacity of lawyer. This should be well understood by the financial public in England.

It would be out of place for me to express any personal opinion on the merits of the case, but I am at liberty to furnish you with the main facts and circumstances upon which are based the pretensions of the plaintiffs in the present case, which is nothing but the first gun of a series of similar attacks in preparation against other mines, such as the Emma and others situated in the same locality. In the case of the Flagstaff, the plaintiffs claim the whole property of the mine under authority of old titles obtained in 1865, and, in order to protect their rights, they ask the Court to grant an injunction restraining the defendants to dispose of the ore daily extracted from the mine, to appoint a receiver, &c., and to leave things in *statu quo* until the case has been definitely settled by a decision of the Court. The defendants, on the contrary, claim that they have secured a patent from the United States, dated September 18, 1871, which gives them full rights of property of the Flagstaff Mine. The decision of the Court will be rendered in a few days, and you will probably be informed by telegraph if the plaintiffs have succeeded in obtaining the injunction. There is no doubt that, should they win, in the first move the credit and interests of the Flagstaff will be seriously affected, and also that of several other mining properties. Judge Strickland is conceded by both contending parties to be an honest and upright magistaate.

You may rely upon the fact that very strong parties in San Francisco are at the head of the present movement. They are a ring of notorious mining operators, having an unlimited amount of capital at their command. It will be a war of long duration, as they intend to continue the fighting of this and other similar cases for many years to come, until they have succeeded, with the magnetic power which, unfortunately, money has in this part of the world, in carrying their object, which is, in my opinion, the control of the mining interests of the young Territory of Utah. J. BERTON,

Salt Lake City, Utah, May 19. Vice-Consul of France, President of the Mining Bureau.

PACIFIC COAST MINING INVESTMENTS.

SIR,—In the Supplement to the Journal of April 6 a correspondent, signing himself "Anglo-American," deals with the question heading this letter, from motives—so it seems to me—too transparent to be mistaken, notwithstanding the effort is purposely disguised by a flippancy and boldness both of tone and manner evidently assumed for the occasion. He, in effect, pooh phoos the idea that English capital and English common sense and experience are sufficient to secure good mines on this coast for investment. But such an assumption is very wide of the truth, and one which I hesitate not to controvert. I freely grant, however, that in too many instances English inspectors of mines have allowed themselves to be misled by the artificial inflation and gaudy embellishments with which most of the bubbles have been dilated and gilded. During the somewhat extensive peregrinations for the purpose of examining mines in the State of Nevada I have encountered every artifice and phase of deception in practice amongst the wily pioneers, the original holders of mines, shrewd men from almost all countries. But by disregarding the ostentatiously displayed gilding, and confining myself to the hard facts of experience relating to the nature and constitution of lodes as they present themselves to the eye and to the mind, in all their unadorned simplicity, I have seldom, if ever, found inferences from my European experience at fault here, subject to certain circumstantial modifications which unprejudiced reason will always readily suggest and equally approve. I have almost invariably found that both the artificial and superficial character of mines stand revealed before this test, and with too much prominence to be mistaken for the permanent class. I have previously stated in the columns of the Journal that English mining captains, when engaged and sent to this country to inspect mines, cannot do better than to adhere to their own past experience as their guide and standard of reference for all mines here. And when they meet with appearances differing from those they have previously been acquainted with to investigate the phenomenon in the light of geological facts, in order to determine the precise period of rock formation to which those containing the mines under review belong, and then submit the probabilities inferred to the judgment for decision, after being fully convinced of its freedom from all prejudice and bias.

It is highly probable that "Anglo-American" may have flattered himself that his gratuitous effusion would be credited in England as an expression from disinterested motives, and that he would not be suspected of having any other object in view than to warn English capitalists of the danger to which they were exposed. Why, Sir, if all the wealth of England was about being transferred from that country to this, and in exchange for skeletons and artificially gilded bubbles, akin to many of those already purchased, no warning voice would ever be raised on this side the Atlantic in deprecation of such an event, nor ought there to be. If the English do not know enough of mining to compete with any nation on the face of the earth it must be because of a lack of moral firmness in individual instances, and not from a deficiency of practical experience, except only when non-practicals are employed.

If the question were asked of parties here by what motive "Anglo-American" was actuated in writing the letter, the answer would be, almost without a single exception, that he had an axe to grind. And I think there can be no doubt but that he was engaged in looking for mines to invest or traffic in, and plainly saw that if the English could be prejudiced against American mines he might be able to accommodate himself at a considerably cheaper rate. Now that I am on this topic I may just as well dilate a little thereon, especially as the facts with which I shall deal are pertinent to the point at issue, and may be serviceable to those for whom they are intended. In the first place, the insinuation that the English can only possess themselves of any mines of value by accident in this part of the country is evidently an inference from certain incontestible errors which have been committed in the selection of mining investments by the representatives of English capital. But can errors, arising from whatever cause, in a mere matter of business conduce in any way to an increase of knowledge and experience of practical mining in an opposite party? Such an assumption may suffice to flatter the vanity of some men, but it must always be pronounced too illogical to obtain either currency or credence in other quarters. I would give ample credit to any mining mountebank who should succeed in foisting upon me any casket, however gilded, as an entirety after the jewel had been abstracted, and would immediately supplement such an acknowledgment by retiring into the cold shades of well merited obscurity. When in my official rambles I encounter disrupted jumbles of vein matter and bed rock I do not suffer myself to be diverted, however imposing and impressive the display may be, from first principles, but steadily resolve to investigate the phenomenon on *them* as a basis, and to accept whatever conclusions may be arrived at, subject only to the approval of reason. Beyond the compass of my own knowledge of the nature and constitution of true fissure veins I base no definite calculations of reliable and continuous productiveness, nor entertain any alluring visions from mere possibilities, as such a margin has far too wide a range to be made the basis of anything but an ideal superstructure,

It is certainly refreshing to anyone like myself to witness the effort of "Anglo-American" to propagate the notion through the medium of the Journal that the depth and comprehension of English experience is unequal to the discovery of anything valuable in mines, regarding their merits or demerits, on the basis of physiological facts. But that the American owners and investors, whose experience is but of yesterday, should be in possession of that amount of discriminating knowledge, both as to its intensity and scope, which enables them to select and to retain the whole, or nearly the whole, of the great and the good mines of the country as permanent sources of income and profit, and to dispose of nothing but facinating, because showy, trash, decorated by either nature or art, or both, and fit, or designed, only to deceive. I should be sorry indeed to betray the weakness to suppose for a moment that "Anglo-American" was actuated in his motive by honest ignorance of the subject, and that he really believed what he wrote; I shall rather do him the justice to say I entertain the idea that he was prompted by an ulterior object, and a decidedly selfish one. Why, Sir, from my seven years of outlook from my present stand-point upon this scene I have witnessed the fruitless, and to me senseless, squandering of millions of dollars under the auspices of that selfsame class in favour of whom such consummate discriminating knowledge is arrogated, and the objects mines to which had it been properly applied would have become prolific and permanent sources, in the ordinary acceptation of that term, of wealth and profit. But, as it is, the wealth remains in the close embrace of its containing rocks, whilst the enormous sums of money said to have been applied to its development have disappeared, and "left not a wreck behind," except it be that of some unlucky wight's fortune, or, as is too frequently the case, some prematurely erected mill. If my opinion were consulted in regard this matter, I should most unhesitatingly say that "the boot belongs on the other leg. Notwithstanding some transparent and conspicuous errors may be referred to in support of the allegation, one part of which at least I aim, and think I am able, to rebut. I could name a large number of good mines, some seriously impared in their productive capacity, and others in entire abeyance, in this State, only because of their intersection and displacement by ordinary cross-courses and faults, and the lack of the necessary knowledge, experimental and otherwise, to indicate the direction of and recover the truant veins. There is a mine not 30 miles from this place containing one of the finest lodes I have ever seen in the State—large, from 12 to 21 ft., and well defined. Its character was proof against fastidious exceptions, and its produce and yield most abundant and satisfactory, until it encountered in its northern drivages a cross-course, and that has proved a fatal blight to the enterprise. Company has succeeded company in endeavouring to resuscitate the lost mine, but hitherto without avail. I examined the mine about three years since, for personal information, per favour of and accompanied by the then superintendent, and very soon became convinced of the true state of things. To me there was nothing embarrassing in the situation. I would have undertaken at that time, or at any rate subsequently, to have found the missing lode in less than a month, with one set of men, and would have made my remuneration for the satisfactory determination of that important and vital point a contingency upon its success.

The case I have instanced is not a solitary one, as within the distance I have named of that mine from this place as a radiating centre, I could name a score or more of mines similarly degraded through ignorance. And in more distant parts of the State a number, if not an equal number, of remarkable instances—chiefly remarkable, be it understood, because of the ease and certainty with which the phenomena may be interpreted by properly qualified and experienced men. I know from personal observation of thousands of tons of ores of a quality which, by comparison, may be termed rich, concealed only by some flimsey but well-defined cross-course or fault. And to unlock these treasures is just as easy, comparatively, as the opening of a door by simply removing its bolts and bars. If these and such like facts are evidences of keen penetration, and a superior breadth of discernment, then I say let those whose vain souls are susceptible of pleasure and gratification from such considerations revel in all the intoxication which the most licentious indulgence in such harmless vanities may afford.

I shall conclude by saying that from all I have seen, heard, read,

and considered of the nature of mines and of mining since I have been in this part of the country all its phenomena are susceptible of interpretation in precisely the same way, and on the same principles, geologically and otherwise, as are found to be effectual in England and other European countries. The notion which is entertained by many here, and attempted to be foisted upon others coming from foreign parts, that there is a radical difference in this respect is, to say the least of it, an error. ROBT. KNAPP.

Ellsworth, Nye County, Nevada, May 8.

WHAT TO SELECT—WHAT TO AVOID—No. XXIII.

SIR,—The mining investor should watch (for by doing so he cannot fail to turn it to profitable account) the periodical variations which the public evince in their partiality for a particular class of mine shares. Some three years since an extraordinary *furore* existed for lead mines, attributable in no small degree to the success of Van, Tankerville, Roman Gravels, &c. This was followed by an equal excitement for American silver mines, resulting from the expected success of Eberhardt and Aurora, South Aurora, &c. Then, again, attention was almost exclusively directed towards home tin mines, which, for the moment, has given place to a demand for the shares of copper mines.

It would seem, therefore, that mining, like everything else, has its fashion. It often happens that in these somewhat erratic changes the shares of a mine producing a metal that is temporarily in less comparative request than others, decline in value from inanition, so to speak, to a price very far below their actual worth; while, on the other hand, the shares in other mines producing a metal that is in more active request advance in value as far above their present or prospective worth.

In the present condition of the mining market the writer may venture to again point out that the values are oftentimes advantageously or adversely affected irrespective altogether of any change in the mines themselves; hence the investor should never allow his opinion of a mine to be unduly influenced simply on account of an inflated or depressed market value.

These remarks are especially applicable to very many mines the shares of which have declined in value simply because less attention is directed towards them, although the mines themselves are really of greater value, important discoveries having been made, and the general prospects materially improved. Two cases in point are WEST TANKERVILLE and PENNERLEY. The prospects of the former are in every respect more encouraging than at any period since the formation of the present company. The writer may remind his readers West Tankerville immediately adjoins Roman Gravels, and that Capt. Arthur Waters, who is the manager of both the mines, has stated that the future history of West Tankerville will be equal to any of its surrounding mines. The accounts show an unexpended balance of 5000*l.*, the mine being provided with ample machinery to fully develope its resources. As to PENNERLEY, when the mine was in a much less productive position than it is now, when a monthly loss was incurred instead of a profit being realised, and when its permanent value was less established, its aggregate market value was considerably greater than now, when important discoveries have been made, a monthly profit of between 200*l.* and 300*l.* is being realised, and its permanent value considerably augmented.

AMERICAN MINES, AND THEIR TITLES.—It is much to be regretted that the English public who hold shares in American mines do not make themselves familiar with the legal value of the title of the property in which they have invested their capital. Had they acquired this very necessary knowledge less unfounded temerity would ensue; and upon the publication of letters from the representatives of self-appointed bureaus, the first fact to be ascertained is—Does a mine hold a United States patent? if not, there is always the liability of litigation, with a very uncertain issue. If, however, a patent is held the title is clear and indefeasible. As in this country so in America, speculative lawyers are not wanting who do not hesitate to commence litigation, although perfectly aware they have not the slightest chance of success, their object being nothing more nor less than to levy black mail. Such dastardly proceedings are never commenced in connection with any mine other than those proved to be of great value, and it cannot be too generally known that these have never in any single instance been known to succeed—that is, where a United States patent has been held, its possession being a complete, legal, and acknowledged bar. Before the American Government grants a patent several important, and somewhat tardy, legal forms have to be complied with, and their observance is absolutely imperative to ensure the grant, so that it is obvious that when a patent is assailed it can be with only one object—black mail. Therefore, shareholders holding an interest in a mine with such a title (and knowing the mine to be of value) should not allow themselves to be carried away with the excitement of the moment, sacrifice their property, and at the same time play into the hands of a clique of unscrupulous black-mailing American lawyers, who have but one purpose to serve—their own personal aggrandisement.

Finer's Hall, Old Broad-street. FREDK. WM. MANSELL.

INCIDENTS IN MINING—No. II.

SIR,—What wonderful sums of money have been paid for mining setts, sums which in many cases have been so much lost, for the money has been, in general, paid for purely speculative mines, or for grants where no mine existed, but only a "bra keenly lode," or perhaps lodes of doubtful character. You are aware that for a mine lately brought out 500,000*l.* was charged. Another mine now advertised is to be sold for 10,000*l.* if purchasers can be had, and in Wales five mines were sold for about 170,000*l.*, with little or no ores in sight. I have heard that ill-gotten money does not stand long in any family. I am sure that money so acquired is iniquitous. I approve of promoters charging something for a mine, but to charge at the rate that some persons have been charging is shameful imposition on the unwary.

In this letter I purpose to give you a little of my own experience in connection with a mine promoter, who is also a broker, resident in the metropolis. He has in his day been extensively engaged in "floating" mines, or what he called mines, a history of which would be very entertaining, but upon which history I shall not now enter. Some years ago he obtained by purchase for a small sum (not 100*l.*) the lease of an old shallow mine in the vicinity of a popular district in Cornwall, and he desired my co-operation in putting it before the public, he agreeing to pay me one-half of whatever sum should be realised by the sale. About 700*l.* was set down as the price. The usual means were adopted for inducing the investing public to take shares, but without much success, the spirit for mining being then very low; but one of the shareholders informed me that the promoter had been paid by himself and others at least 700*l.* This the promoter denied, and I am now prepared to say which of them spoke the truth. During the time that these efforts were being made I lent the promoter, and paid for advertisements, plans, prospectuses, postage, hotel expenses, little short of 150*l.*, every penny of which I have lost. I should have stated that before I expended anything on the mine a person agreed to buy the same for 300*l.*, and gave his acceptance for that sum, but the bill was dishonoured, and the acceptor subjected to criminal proceedings. This mine is still idle, but I have heard that it is likely to be worked shortly.

I will now give you a little more of my experience with the same promoter, whom, for brevity's sake, I will call "A." There is a mine in a Cornish district which, a few years ago, yielded large profits, and the shares, consequently, commanded a high price. "A" said to me in a letter, "Can you get a sett on the run of the lode in —— mine? If you can I will try to sell it, and will undertake that you shall have one-half of whatever sum I make of it." I knew an old mine, not deep, contiguous to the mine he referred to, and having the same main lode. As I was well known to the two lords' agents, I applied for and obtained the grants on paying four guineas. "A," finding such to be the case, wrote for them, and I sent them to him. Little time elapsed before a letter came announcing the sale of the mine for 350*l.* I thought it right to look after my moiety; so, taking train, I soon got into the City, when I found that the money had been paid into the hands of a firm of solicitors for distribution amongst "A's" creditors; and that, instead of retaining, or directing to be retained, for me the sum of 175*l.*, there was only the amount of 12*l.* 10*s.* set down against my name! When I remonstrated with "A," he said, "I sold the mine, and did all the work." So much for experience No. 2. You would naturally infer that, after such conduct in "A," I should be rather shy in dealing further with him in getting up mining companies. But time annihilated my anger, so that on a similar application made by "A" in December, 1870, I got him another sett, concerning which I will give you my experience in letter No. 3.—*June 8.* AN OLD READER.

EXCELSIOR MINE.

SIR,—The quotation of this mine, nominally at 15*s.*, is one of the enigmas of the Mining Exchange which needs a little ventilation. The residents of the Callington district are beginning to open their eyes to the late discoveries of tin here in the Holmbush lode, worth 50*l.* per fathom. The shares in number (after deducting forfeited ones) are 12,000; at 15*s.* this puts a market value of 9000*l.* on the mine. This sum for a splendid property is simply an absurdity. The calls have not exceeded 6*d.* per quarter, for the mine has been worked by adit levels driven into the mountain side until the sinking (lately) of the new shaft. All are pretty confident that immense wealth will be discovered beyond present indications in a very short time, and that Excelsior will, probably, rival the Treleigh Wood Mine, which has caused such a sensation in tin mining. The shallow depth of the shaft, at which the adit driven west will meet it—22 fathoms—is expected to open out great riches. The report of May 15 states that this new level, taken up at the foot of the hill, is being pushed forward with the utmost dispatch by six men, and this point of operation is looked forward to with the greatest interest. Capt. G. Richards is quite sanguine of further vast discoveries when the shaft is sunk down further. It is generally believed that when it is down 45 fathoms the lode will be worth 150*l.* per fathom again. The north part of this magnificent lode will be the most productive part, and more valuable at the present depth if driven on, the "old miners' workings" being so very extensive there, and their continuous burrows still contain rich stones of tin. Operations are now carried on in that direction to prove this fact. Excelsior is truly one of the cheapest investments in the market; economy and skill prevail in all its management, and few mines now offer greater inducements. Mr. Murray has a great opinion of Excelsior Mine, and his judgment of the enterprise is rapidly being fulfilled. SAPIENTIA.

MINING WEST OF THE CELEBRATED VAN MINE, MONTGOMERYSHIRE.

SIR,—I am credibly informed that the above district has within the past week been carefully examined, for upwards of four miles in length, by a well-known practical mining authority, Capt. George Spargo, late from Cornwall, now of the Brynambor Lead Mines, Cardiganshire. Having known him as a mining engineer upwards of fifteen years, during several of which he managed the gold and copper mines of Merionethshire, where he gave general satisfaction as to ability and integrity as a miner, as well as to the truthfulness of his reports, I feel satisfied any information he may give relative to the mines and district he surveyed will be given truthfully and without prejudice. He being well known to private capitalists not only in London but also in the North, I trust his inspection will be the means of lasting discoveries being made, and be a general benefit to those connected.

Llandloes, June 10. A WELL-WISHER TO LEGITIMATE MINING.

VAN CONSOLS.

SIR,—In a letter in the *Mining Journal* of April 20 (which I have only just received) I observe that some remarks and statements respecting my management of Van Consols are made greatly to my disparagement and Capt. Roach's credit. In reply, I must state that the cross-cut from Little's shaft was driven by me, and had I retained the management of the mine long enough later to have driven through 2 fathoms of ground on the course of the lode, the ore at Little's shaft would have as certainly been discovered by me as it was by Capt. Roach. "Eye Witness" states that that I "had driven a cross-cut from the poor part of the lode, and was then driving parallel with it, which might have been continued *ad infinitum*, without beneficial result." I directly and most emphatically deny it; neither at Little's shaft nor any other part of the mine could he have found that I had been driving parallel to or passing ore ground, or even intended to drive levels in such a direction that they might be continued without beneficial result.

The excellent order the mine is in which "Eye Witness" speaks of in his allusion to the way the ore ground could be opened up was brought about under my management, and not under Capt. Roach's, who could not have done very much of the work in so short a time. Capt. Roach made some ineffectual attempts to work the eastern ground by sinking two shafts some years ago, which I suppose "Eye Witness" was too blind to see.

Whatever the extent of the ore at Little's shaft may be, Van Consols is a fine property, and I have no doubt if the new ground is well explored good courses of ore will be discovered. THOMAS CORFIELD.

Sombrero, West Indies, May 23.

BURROW AND BUTSON MINING COMPANY.

SIR,—I note in your valuable Journal of last week the plan of the Burrow and Butson Lead, Blende, and Copper Mines, in the parish of St. Agnes. I am well acquainted with these mines, having been one of the shareholders when they were worked in 1832; and in 1834 we sold the mines at a good remuneration. During the time we worked these mines the tributers did well at the back of the adit level. We had a very good lode of copper ore and jack, coated with grey and black ore mixed. All the shoots of ore we met with dipped to the west; therefore we always considered that Wheal Butson would prove one day to be a valuable piece of ground, judging from the ore we had picked out from the burrows. I should think that the lode must have been, and still is, a splendid-looking one. The lode is composed of copper ore, mundic, and soft spar—ores that would realise in the market 1*s.* per unit more than the ores raised in Wheal Burrow. I should be glad to see the day when the water will be pumped out of this mine, and the two new south lodes proved to the depth of 30 fms. Wheal Butson has not been worked under adit in the remembrance of anyone. Those two south lodes have been seen only to a depth of about 2 fms.. We could not go deeper on account of water.

I know nothing of the gentlemen who are about to work these mines, but I hope they will give Wheal Butson a fair trial, for I am fully persuaded that they will be well paid for their outlay. I have some recollection of hearing, about 35 years ago, from one of the old men that there is a cross-cut driven south from Wheal Butson to cut those two south lodes, but for some reason the mine stopped before they reached them. Wheal Burrow I know nothing about, under the adit; what we did was above. We raised large quantities of ore, jack, and gossan. I remember selling one parcel of jack and copper mixed, 45 tons, which realised 1*l.* 15*s.* per ton, now worth 8*l.* 5*s.* We also sold large quantities of gossan at 28*s.* per ton, delivered, now worth in Swansea market 60*s.* for silver only, and if it contained gold, of course, it would be worth much more. There are buyers here for every description of ore.

Swansea, June 11. JAMES STEPHENS.

EAST LLANGYNOG MINE.

SIR,—Mr. Meginn, in his letter in the Journal of June 1, states that with one exception "the secretary has never had to wait a day for directors' signatures to certificates." Now, in December last I purchased some shares through a broker, and, though I have made repeated applications, I am still minus the scrip. In short, my last letter, written about a month since, was met with the following reply:—"We have not the East Llangynog scrip yet, there is great difficulty in getting the shares delivered." If Mr. Meginn's assertion be correct, there must be a lamentable want of truthfulness in the latter statement. I am pleased to see that another shareholder is ventilating the question as to the propriety of publishing periodical reports of the progress made, and think that much of the alleged mismanagement in the past, and much of the present altercation, might have been obviated had such a mode of procedure been adopted.—*Chippenham, June 12.* Æ.

GREAT EAST FOXDALE MINE.

SIR,—In the Notices to Correspondents, in last week's Journal, "W. P." asks for information from some of your readers relative to the above mine. I beg to suggest to "W. P." that, instead of troubling the public, he should have addressed a letter to the secretary of the company, at the company's office, 59, Seel-street, Liverpool, from whom he would have received a prompt reply, with full explanations, &c. I may here tell "W. P." that it is not the wish of the directors to have weekly reports sent to the *Mining Journal*, such reports being in many instances but mere repetitions. If "W. P." is a shareholder he will recollect what passed at the first or provisional meeting of the company, held on Nov. 27; and although we have had but little time since that meeting up to the present, the greater portion having been very wet and bad for out-door work, yet I am glad to say that we have succeeded in erecting and completing our new engine and boiler houses, offices, &c., and have now fixed the pump down to 45 fms., secured and thoroughly repaired the old engine-shaft—and, in short, have placed the mine in thorough working order. We are now busy clearing out the levels driven east from the shaft by the old miners, and I am happy to say that there is a fine rib of ore in the said level, varying from 3 in. to 15 in. wide; and the more we open out at surface, as well as underground, the more satisfied are we that we possess a first-class mine. I fully believe this mine is as valuable as that of our neighbour, East Foxdale, as it is proved that the rich east and west lode runs through the entire of our sett. I should wish to suggest to "W. P.," or any shareholder or intending shareholder, the propriety of taking a trip to the island, as it would not only do his health good, but would afford him the liveliest satisfaction to see the course of ore we have already discovered, and from which we have taken a solid mass of silver-lead weighing 2 cwts., and containing 30 ozs. of silver to the ton. "W. P." may rest assured that not a moment has been lost in developing the resources of this mine, at the same time observing a strict regard to economy, so that the shareholders may be saved from every expense that could be judiciously avoided. This will show for itself in the balance-sheet to be produced at the next general meeting, which will be held the first week in August next.—*Seel-street, Liverpool.* T. HUGHES, Managing Director.

BEDFORD CONSOLS—GAWTON.

SIR,—Allow me to direct attention to a paragraph in last week's Journal, in which the price of Bedford Consols is compared with Gawton shares. The writer says the one is selling for 25*s.* to 30*s.*, and the other is feteching 6½*l.* He appears to have overlooked a matter that is more often lost sight of by the investing public than it should be—the number of shares in each mine. Now, Bedford Consols is divided into 12,000 shares, Gawton into only 3950; therefore, if he were to divide Gawton into the same number of shares as Bedford Consols he would find that the price of Gawton shares would be equal to only 2*l.* against 30*s.* for Bedford Consols. I know nothing against Bedford Consols, but the price at which such a splendid property as Gawton is selling at seems ridiculous. READER.

London, June 10.

TERRAS TIN MINE, AND ITS MANAGEMENT.

SIR,—Will you allow me a few lines in your next issue in reply to the remarks in last week's Journal. I shall not attempt a *seriatim* dissection of all the twaddle therein, but shortly state a few facts in justification of the character of men who might be prejudiced if an anonymous stab should have any effect. If your correspondent is ashamed of his name let him hold his tongue, or his effusions will in future pass unnoticed.

The "bears," as Mr. Bastow may choose to designate them, I call victims of unscrupulous people. A friend of Mr. Bastow's signed a transfer for shares, for which it is said bills were given (financing again). When the certificates were sent in the secretary kept them. Had the shares ever been paid for? This caused considerable unpleasantness—the purchasers wanting the shares, and the seller being unable to deliver for the time, the transfer not being made good. In the midst of an altercation between the parties, I volunteered to go north by night mail, provided my expenses were paid. Never having dealt in a share to that day, I could have no personal interest.

I got without much difficulty what shares I wanted. I refused one lot more subsequently, but knowing their utter worthlessness intrinsically, I would not buy until I sold them. How and what influences were brought to bear to induce the parties to keep their shares, and the most unfounded statements of the mine being richer for tin than Dolcoath, &c., I could say; but suffice it, out of nearly 1000 shares offered me I only got about 75.

I feel satisfied to be the victim rather than the victimiser; and such is not my feeling only, but of every man on the London market who has been entrapped into dealing in such a questionable scheme. As to the merits of the property, consult any practical authority who has a position to lose. Capts. Pascoe, Puckey, Gregory, Rogers, Josiah Thomas, or Charles Thomas, who, I am informed, have all inspected it. Surely there need be no difficulty of arriving at an opinion. Mr. Nicholas Ennor, who has been on the mine since Capt. Rogers was, informs me "The stuff will never pay to turn over twice." Pray how is it to be dressed? any novice knows the cost and labour of tin dressing. As to the insinuation made by Capt. Rickard and others respecting the report being made for "bearing" purposes, no fouler insult could be offered to a man whose whole life will take Capt. Rickard's remaining days to find a hole in it. It may be the practice at Terras to report according to the necessity of the book, but I, during 20 years' experience, am glad to say I never found that dishonest practice west of Truro.

Let Capt. Rickard report his own mine faithfully and honestly, and when he sees tin no thicker than tinfoil in the elvan refrain from valuing it, not imagining it is all tin. If Capt. Rickard will inform me when he has any point, or all the points of operation, that can be valued at one-half his valuation, as reported in the *Mining Journal* of May 25, I will telegraph a respectable agent, one who has the confidence of the mining public, and should such be found to be true I will pay his expenses, and I am authorised by a lover of truth to say he will give 10*l.* for the benefit of the Truro Infirmary.

Is it not a fact that for weeks past an advertisement has appeared "Wanted 100 men for Terras Tin Mine?" And that about a month ago miners went from Tavistock, and were told they were full? This is stated to me as a fact.

47, *Threadneedle-street.* H. WADDINGTON.

P.S.—To the insinuations and mis-statements of Messrs. Bastow and Rickard, in the Supplement to last week's Journal, I can only say they are totally devoid of truth. I never saw or knew what Capt. Rogers's report would be until I received it a week after inspection. Capt. Rogers did not write his report in London, nor would any honest man intimate or charge a respectable man with such inconsistency. Mr. Bastow has my authority to apply to the officials of the Leeds telegraph office for my original telegram or copy thereof. That Captain Rickard values the elvan at 6*d.* or 7*d.* per fm. convinces me that it has no real value, since it costs 10*d.* to get 7*d.* worth of tin; therefore, its negative value is 3*d.* per fm.; this is proved by their accounts. Capt. Rogers has not spent 57,000*l.* at Wheal Agar, nor yet 17,000*l.*, but what has been discovered is due to Capt. Rogers's sagacity and practical knowledge. H. W.

TERRAS TIN MINE.

SIR,—In the Supplement to last week's Journal "Figaro" assumed that the rich tinstuff from the lodes in this mine had been stamped, and formed a portion of the 10 tons 3 cwts. 9 lbs., the result of two months' working, and adds, "In that case the elvans must be poor indeed." I beg to say that such is not the case, and not a particle of the Edwards' stuff was reduced or formed a part of the tin sold. It was entirely and purely from the elvans alone. I do not offer this explanation with the view to enlighten "Figaro;" I am persuaded that he was cognizant of the fact. I do so on account of our friends who may have overlooked the matter, and to warn them against "Figaro's" side thrust.—*June 13.* MARTIN RICKARD.

TERRAS MINE, AND "FIGARO."

SIR,—In last week's Journal "Figaro" quotes from my previous letter, and asks an explanation, which I am happy to afford him. Thus: "These elvans, so very poor, have yielded 10 tons 3 cwts. tin in two months;" and he calculates that allowing 1 ton per head to be stamped per day will give nearly 8 lbs. of tin per ton, and concludes that as there are rich lodes in this mine, it may be fairly assumed the ore raised is included in the above average. "In that case the elvan must be poor indeed." His assumption being contrary to fact, his conclusion is "poor indeed," and this reminds me of the passage "he who filches from me my good name"—"makes me poor indeed." He forgot to give us the first part, no doubt wishing to help the "bears," for they have done their best to make Terras shareholders "poor indeed." Had he read the report by Mr. Calder, C.E., in the Journal of the previous week, he would have seen that "any tin yet sold has been obtained from the elvans;" and if he had been conversant with mining, and did not intentionally wish to depreciate the mine, he might have known that while valuable ore may be discovered in a lode it takes a considerable time to open it up, so as to get sufficient quantity of mineral to crush. But I am glad to inform him that while hitherto fine ore has been piled till such a sufficient quantity was got as would keep some stamps going. Such has been gathered, and this week some 10 heads of stamps will be devoted to the crushing of this ore, so that at next sale, on July 9, we may expect an addition to the last quantity of 10 tons sold.

I hope now to leave those "bears" whom I have exposed to suck their paws at their leisure, congratulating them upon their success, but I intend to make one of the party, who I see was again on the last "bearing clique," dance to a tune he may not like, by suing him in Court for 140 shares sold to me, to be delivered last March; and another party for 25 shares, sold during the last panic caused by these "bears." I have a large stake in the mine, and they will find me both able and willing to show up them and their discreditable proceedings. Their safest course is to turn "bulls," and then they will find how difficult it is to get delivery of shares bought.

Messrs. Hume and Co. advertised 500 shares for sale, which I look upon as another mode of "bearing;" for I wrote and asked their price for the whole or a portion, and they answer they are in treaty, which prevents them entering into such negociations, and ask me to make an offer. Have they any to sell? If so, let them quote the numbers of the shares as registered. It is no use buying from parties who cannot deliver. ONE THOUSAND SHARES.

THE TERRAS TIN MINE.

SIR,—It would appear that Terras Tin Mine has not only outlived the slander, evil-speaking, and even villany of its detractors, but that it is held in high estimation by the public; for, good as is the demand for its shares, not one is to be found in the market for sale.

This little new mine is most regularly and satisfactorily unfolding its wealth, each report of the manager showing an improvement on the one which preceded it. The report of April 25 stated that one of the points in operation was worth 30*l.* per fm., and another 50*l.*, a circumstance which on no preceding occasion could have been asserted—hence the proof of the gradually improving state of the mine. I have no pecuniary interest in Terras—I never had—but in order to show the difference between the prophecy and assertions of a man who may reasonably be supposed to know something of mining, and that of the detractors of Terras—who seem to try to earn their bread by endeavouring to depreciate the property of others—and who know just as much, and no more, of the merits of a mine as a South Sea cannibal knows of Algreba. I beg the favour of you causing to be inserted in the next issue of the Journal the following letter, which in September, 1870, you did me the honour to publish.—*Austinfriars.* JOHN LEAN.

"*September 8, 1870.*—It afforded me great pleasure to accompany you and the rest of the party of gentlemen into Cornwall on a visit to the Terras Tin Mine, but in doing so it was not my intention to write a report on it; as, however, on our return to town you expressed a wish that I should give you my opinion of the property, and that I should write something thereon, I will do so, but you must not expect anything like a detailed report. I would say, then, that no man of any practical knowledge of mining can carefully look at such an interesting mining sett without feeling deeply impressed with its value and importance. Seeing that there are several lodes extensively laid open on the backs by the ancients, and from which it is quite evident that they must have extracted large quantities of tin, that these lodes traverse an extensive sett, situated in a neighbourhood the nature and character of which are tin-bearing, I cannot but think that they alone are sufficient to justify the outlay of capital to work them as a mining enterprise.

From the valley an adit has been driven into the hill—say, about 100 fathoms—and which, by a little additional extension, would have intersected some of the above-mentioned lodes (say) 30 fathoms below the surface. It is, however, the immense stanniferous elvan course with which one at first sight is more forcibly struck. To this, as you no doubt observed, are confined principally the present operations, and that it is the source whence is drawn the supply of tinstone for the stamps. The direction of the above-cited lodes is about east and west, and that of the elvan course about north and south, so that the latter intersects the lodes at about right angles. This elvan course is of great importance, not only as regards its intrinsic value as a tin-yielding source, but the presence of an elvan course in the vicinity of lodes invariably enriches them. The Terras elvan course, as you noticed, is being worked quarry-like from the surface, and from a series of trials that have been made is said to produce 1 cwt. of black tin to 10 tons of stone, or about 12 lbs. to 1 ton, and from its thickness and the extent to which it can be traced on the back going into the rising ground, may be supposed to be almost inexhaustible. That this elvan course will be enriched in depth—*i.e.*, that the quality of the stone will improve as the depth increases—I doubt not. Looking at it analogically even, this cannot reasonably be doubted, but it has experimentally been found to be the case in the excavation which has been made for the decomposed elvan below the vegetable earth, but immediately above the elvan stone contains tin. The stone itself immediately below it contains more, and, at the bottom of the quarry, which at the deepest part is 25 feet below the surface, the quality is decidedly better than it has been at any place above it. On the opposite or south side of the valley from the Terras Mine a new mine on the same elvan course has recently been opened, and on which a water-wheel stamping-mill has been erected, but the quality of the stone has hitherto been found to be inferior to that of the Terras; no doubt from their not having as yet attained an equal depth. From the fact that this elvan course is found on each side of the valley, I think it may safely and confidently be inferred that it will be lasting in depth. This is an important feature. The stone from the Terras elvan has hitherto been carted from the quarry to the stamps, but a level designed for a tramroad is now being driven from the stamps to come in below the present bottom of the opening or quarry, so that the stone will be thrown from all parts of the quarry down into the tramway, and tram-wagons soon (say in the course of four months) supersede the carting. As the elvan course runs into rising ground, for many years to come (should it be found desirable to confine the operations thereto), a sufficient quantity of stone may be extracted therefrom to supply whatever number of stamp-heads it may be desirable to erect. This mine is in its infancy, and—as of necessity it must be with every new mine so with this—the erection of machinery, the fixing of the necessary appliances, the laying out of the ground, &c., for the reduction, various manipulations, and preparation of the tin ore for market, cannot be done at once. The necessary appliances and apparatus for the reduction and the dressing of the ore will be extended, and the produce of the mine increased as time goes on, and the regular and progressive development in every department will take place; but a new mine cannot possibly at once be started into full development. They have done a good deal in their preparations, or preliminary work, in the last three or four months, and have now 48 heads of stamps in working order, although probably, from being over sanguine, and, therefore, not coolly and patiently calculating the time that it would require to enable them to begin to dress the ores, the statements in former reports with regard to the bringing of a stated quantity of tin into the market may not have been exactly verified, yet this has by no means detracted from the intrinsic value of the mine. Terras instead of being, like the generality of Cornish tin mines, wherein the ore has to be extracted by powerful machinery from a depth of 200 or 300 fathoms below the surface, and where the draining has to be effected through the medium of gigantic and most expensive steam-engines, is, as before said, worked as a quarry, open to the surface, and for many years may be thus worked above the water level. It is most conveniently situated, being not above three miles from the Grampound Station of the Cornwall Railway, and the sett is surrounded and traversed by excellent common roads. They have sufficient water for the purpose of dressing the tin ore, and the ground is of the most favourable description for the extension of their steam stamping-mill, and for the laying out to whatever required extent, their floors and apparatus for dressing. In conclusion, I do not remember to have seen any mine in which it was apparently more safe to invest capital than in Terras, and would recommend those who purpose to lay out their money in mining to go thither and see for themselves."

JOHN LEAN.

THE NEW QUEBRADA COMPANY.

SIR,—The following I have extracted from a circular sent me by Mr. T. G. Taylor, of Finner's-court, Old Broad-street, London:—

"NEW QUEBRADA.—Shareholders have a tempting opportunity to sell. Of all the Central American swindles this has been one of the worst and most disappointing. The first holders were plundered heavily, and *spoliation* (*sic*) and mismanagement have squandered two or three re-constructions and supplies of capital, and disgraced as many boards of directors. Another group of victims is now required. Fables of an agreement to make a railway by Messrs. Brassy, with English navvies, in a climate where it has been repeatedly proved that none but hycnas and natives can live) are circulated, and a fictitious value given to the shares to lure the proprietors to find more capital. I assure would-be investors that for years my experience has been that of all joint-stock enterprises this has been the most deceptive

the most wretchedly mismanaged, and the most miserable and continuous series of failures."

If Mr. Taylor's desire in sending me the circular be to sympathise with me as a shareholder in such an unfortunate enterprise I accept and most heartily thank him for his sympathy, but if, "on contrare," he be scheming to get possession of my shares I would most respectfully inform him that I do not intend to part with them at present, for, however I may feel disposed to endorse Mr. Taylor's observations, I do not feel sufficient confidence in his apparent anxiety for my welfare to induce me to follow his advice in this matter. I shall, therefore, keep them.

I cannot but think, Sir, that the directors are acting unwisely in their reticence, as I believe they will discover at their next meeting, now so long over due.

AN ORIGINAL SHAREHOLDER.

PINTO MINE.

SIR,—I regret that my letter, published in the Journal of May 25, did not succeed in eliciting a more satisfactory reply than that of your correspondent, "C. M. R." I will grant that the roads remain impassable for the conveyance of ore, but is that any reason why the shareholders should be kept in the dark as to the operations at the mines? The superintendent was instructed some time ago to furnish the fullest information, but none has yet appeared; the directors are disappointed—of course, the old story. I should like to know why there is no quotation on the Stock Exchange, and also why monthly reports are not regularly published, as are those of other companies? Shareholders are apt to attribute such omissions not entirely to neglect, but to other and worse causes. C. ANDREWS ("Expectans").

Throgmorton-street, June 10.

NOVEL STAMPING ARRANGEMENT.

SIR,—I noticed some remarks in the Supplement to last week's Journal on my stamps; I was surprised at your printing them, as you have been long aware that I never reply to men who dare not put their name to what they write. I am informed the writer, a pretended engineer, is a cross breed between an Ancient Briton and a Kilkenny cat; this I cannot credit, as I am led to believe there is a little more manliness about the Ancient Briton than to be guilty of such a trick; if a cross breed, he may turn after the Kilkenny cat, as it is well known their deeds are evil, and they are ever known to be prowling about for mischief, watching for an opportunity to bite or scratch. They dare not, nor cannot, appear with an open and manly face in broad day. I have not time on hand just now to pull the Kilkenny cat out of the mire, but will do so some day. Shall I cut his tail off as a mark for his dirty acts? N. ENNOR.

[For remainder of Original Correspondence see to-day's Journal.]

MENZENBERG MINING COMPANY, NASSAU, GERMANY.

Having, in accordance with yonr request, visited and carefully inspected the above-named mine, I respectfully beg to hand you my remarks thereon. This mine is situated on the eastern side of the Rhine, and about two English miles from the railway station at Honnef, and, therefore, possesses great local advantages for the transport of ores, materials, and so on; and a tramway could easily be constructed on a gentle decline from the mine to the railway, or to the side of the Rhine, by which the produce could be conveyed direct to Rotterdam, and thence to England. The operations at the mine I find to consist of three shafts—Dickin's shaft, Joseph shaft, an adit shaft, and an adit. The adit extended about 65 fms. into the hill, and communicates with the adit shaft at the depth of 14½ fathoms. A side level has also been extended several fathoms, with the object of intersecting a caunter lode. First, then, the Dickins' shaft. This shaft has been sunk about 22 fms. below the surface, on a lode of great width, strength, and capabilities; but it has been worked to a comparative hollowness, in the vicinity of the shaft from near the surface to the present bottom of the shaft, by the ancients. It is, of a certainty, the identical lode of the great and celebrated St. Josephburg Mine, which has been worked from time immemorial, and has yielded almost incalculable wealth: this lode is traceable in its unvaried course for a distance of upwards of two miles. The sinking of Dickins' shaft has accompanied, more or less, the hollows, or now filled-up excavations of the ancients, almost from the surface to its present bottom; a circumstance which has rendered the operation both tedious and expensive; but that the shaft would come upon the old workings, and so have been interrupted by them, I presume could not have been anticipated whilst the surface or sward was yet unbroken. There are no indications that the old workers had ever erected any machinery for pumping, and has the shaft has now reached to about the level of the valley below, whence an increase of water would naturally have taken place, it is highly probable that the bottom of the ancient workings has been reached.—Joseph Shaft: This shaft has been sunk 15½ fms. from the surface, with the object of exploring the lead lodes. One of these—a large, promising lode—is seen at the depth of about 14 fms. from the surface, in a cross-cut, and is there 20 ft. from the shaft, and has an underlie towards it; but, as so small a portion only of it can be seen, it is difficult to judge of its angle of declination. Another similar lode, with an opposite underlie, is stated to be on the opposite side of the shaft: but, being concealed by the timbering of the shaft, I could not see it; and as I could not see or ascertain the angle of declination of these opposite lodes towards each other, it is impossible for me to say at what depth they will unite. The manager, who has also seen the now concealed lode, says that their junction will take place in about 2½ fms. more sinking of the shaft. It would, no doubt, be most desirable to see the junction of these two large lodes, one of which—the one which I saw—possesses all the qualities of a lead-bearing lode, although it has no visible lead ore; but, from the excess of water, which obliges the pump (hand-pump) and barrels to be constantly going, the sinking of the shaft is rendered both slow and expensive.

The Future Working of the Mine.—Unless it may be determined to continue the Joseph shaft to the junction of the two lodes, I would recommend that for the present your operations be confined solely to the Dickins' shaft part of the mine. Sink the shaft 20 fms. below its present bottom, and there, where you may expect to find yourselves deep in virgin ground under the workings of the ancients, and whence, from the hollows met with in sinking, and from the ore also found, it is quite evident that they extracted great riches, drive both north and south on the lode, and also east and west, in order to intersect the other lodes which you have in your concession. As the hill rises rapidly on the eastern side of the shaft, I would recommend that a cross-cut be driven in that direction at the present bottom. As before said, the lode which has accompanied the sinking of Dickins' shaft is that of St. Josephburg. Its character, nature, and accompaniments, as well as the stratum of ground in which it is embedded, are identical with those of that great and prolific mine; so that, if they had riches there, there is no reason why the same may not be fully expected in the Menzenberg—a probability strengthened by the fact that in Menzenberg the ancients, above the level of the present bottom, extracted great riches. In sinking the shaft below the level of the valley an increase of water may naturally be expected; and as you will be attaining a greater depth, and will also, when 20 fms. deeper, be extending and enlarging the scale of your operations for the proper development of your mine, I would beg to recommend the erection of a small portable engine, which would answer the double purpose of extracting both water and stuff. The sinking of 20 fms. in the shaft should occupy (say) five months, and I presume should cost about 12*l.* per fm.—say, 250*l.* No wire-tramway should as yet be made, no land bought, nor any "langeri" (precipitating works) be erected; all can be brought about in the proper time. It will be time enough to accomplish these matters when you have, by further development of your mine, ascertained its riches, its worth and requirements, and established its durability. Have the ore in whole unbroken ground, and you can soon get the necessary appliances and erections; but I do not think that, for the sake of the little ore which you now have, you should incur the expense. There is sufficient space to contain all the refuse that will be extracted from the shaft in the 20 fms. sinking. No purchase of land for this purpose is, as yet, required.—*The Ore*: This is not of great value. There are about (say) 11 tons of low-produce prepared ore, which, perhaps, may be utilised by the langeri precipitating process, but in no other way. There is also lode-stuff produced in sinking the shaft (say) from 40 to 50 tons, which, by reducing it to 20 tons, might be made just of the same quality as that of the already prepared. An average sample of the prepared ore I have brought the England, as well as specimens of ore of a better class. There is also (say) 2 tons, which may probably contain 12 per cent. of copper, and (say) 8 to 10 tons of 8 per cent. In conclusion, judging from the character of the lode—its great width, strength, and capabilities, and seeing that it possesses all the characteristics of the lode in the adjoining rich mines—I fully believe that there is nothing wanting but a little time and perseverance, in the manner described, to make the Menzenberg Mine equal to its neighbours.—5, *Austinfriars, May* 31. JOHN LEAN.

THE LAND OF OPHIR.—Herr Karl Mauch, now travelling in South-eastern Africa, has recently forwarded to Dr. Petermann, of Gotha, editor of the "Mitthielungen," a remarkable account of the gold mines, of great wealth and antiquity, of Solfala, a maritime province lying between Mozambique and the territory of the Transvaal Republic. Dr. Petermann publishes a most interesting circular, from which we extract the following:—"For many centuries, authorities have enquired into the true locality of the land of Ophir of the Bible, whence King Solomon, 3000 years ago, obtained immense masses of gold, ivory, and precious stones. Some have placed it in Eastern Africa or Southern Arabia; others thought it to be in the East Indies or in Sumatra; still others even in the West Indies or Peru. It is certain that they must have been very rich mines from which the gold came. When, in the fourteenth century, the Portuguese came to Solfala, they found there rich gold mines, worked from time immemorial, and near them ruins of structures which, according to native traditions, were built by Queen Saba. Lopez, the historian, records that the natives pride themselves on possessing books which testified to the Ophir cruises of Solomon. From Arabic writers (Mabudi, Edrisi, &c.) we know that this trade was continued throughout the middle ages by the Arabs, who, frequently, from the Persian Gulf came as far south as Solfala. The German traveller, Karl Mauch, undertook last fall an excursion to Solfala for the purpose of exploring the mines and the monuments of antiquity. His discoveries consist of ruins, walls, some of which are 30 feet high, 15 feet thick, and 480 feet in circumference, a tower, &c. The fact of all of them, without exception, being of hewn granite, put together without mortar, testifies to a high antiquity; and the drawings of the ornaments prove that they do not originate from the Portuguse or from the Arabs, but from Phœnicians, the Solomonic Ophir cruisers. The present population has been there but for about forty years. The ruins are sacred to them, and they all believe that whites have once lived in this region. Such would appear to be true from the ruins of houses and the iron vessels found there, which cannot have been the works of the Blacks. Whether or not this land may finally prove to be the biblical Ophir, it is at least sure that what has been found thus far establishes the probability of its connection with the Solomonic Ophir cruisers. Voyages from ports in the Red Sea along the coast of Eastern Africa were within the means of the navigation of that age, and the time of three years, said to be used for the voyage both ways, would also correspond. In short, to the quartz gold fields, the alluvial gold discovered by Burton and Mauch, and the staedily increasing yield of the diamond fields, there seems now to be added, in Southern Africa, also the Ophir land of Solomon. An archæological expedition directly to Sofala harbour, and hence about 160 miles west into the interior, would soon throw light on this question. In the meantime we may expect, with each mail, new reports from Mauch.

A COPPER-FORMING STREAM.—At some miles distant from Kara-Hisar I witnessed a curious and, to me, a novel phenomenon—a stream so strongly impregnated with copper as to present the colour and almost the consistency of pea-soup; its breadth was about 12 feet, its extreme depth 1 foot, or so. Into this stream the natives are in the habit of throwing pieces of iron, in lieu of which they withdraw some days later corresponding bars of the purest copper, every atom of the former metal having been, through chemical action, replaced by an atom of the latter. I had some trouble to get my horse through this stream, as the animal instinctively recoiled from dipping his hoofs into the corrosive fluid.—*Tour in North-East Anatolia.*

Royal School of Mines, Jermyn Street.

[FROM NOTES BY OUR OWN REPORTER.]

LECTURE XL.—In dealing with the various modes of working the stratified deposits we have looked at pillar working and the various modifications of that system, leading us to a principle of working by which, in the immediate neighbourhood of the men at work on the face of the coal, the roof is allowed to break in, and it is necessary for the men to protect themselves by packing and temporary walling, composed of broken material from the roof or partings. Notwithstanding pillar working produces open spaces in which fire-damp may accumulate, that mode of working, or modifications of it, is employed not only in our northern coal fields, but in various other districts of England, as well as on the Continent. When we remember the simplicity of its commencement—driving a bord or stall to enable the men to work forward with safety, and then leaving a pillar between that and the next stall, the principle seems so convenient and natural that we do not wonder it should arise in various districts, independently of one another. The mode of long-wall working is distinctly contrary to pillar working in all the more important features. It aims from the commencement at the removal of the whole of the useful material, or such a large proportion of it that no attempt is made to sustain the roof with any pillars at all. The men are protected close to the face of the working, and allow the roof to fall behind them, upon the refuse they have thrown there. This method is well seen in Staffordshire, where the flat measures are laid out in a wide and artificial manner, but where the workings are extended, so as to be called long wall—a method of the highest importance, and one greatly used in this country, chiefly in Derbyshire, Leicestershire, Shropshire, and parts of Lancashire. There are modifications in practice in other parts of England, and in Scotland. By this method they are enabled in Somersetshire to work seams of coal of wonderful thinness—no more than 12 or 14 inches thick—with advantage. Again, long wall is worked in a great number of foreign districts, modified occasionally by difficulties of roof and floor, and in Belgium, the North of France, Westphalia, and Saxony by the high angle of inclination at which the seams are tilted. In fact, the system is not limited to any district. It is a question, however, whether it is not a method capable of being applied in more instances, and where hitherto it has not been known; and the system is now occupying the attention of mining engineers, and making its way into districts where till lately it was but little understood. This system of getting the whole of the coal and leaving no pillars is best applied where the beds are favourably placed, and where the conditions are suitable. Take, for instance, beds of ironstone, in getting which a great portion is to be left behind as refuse, and which being placed properly in the gob, the roof is not let down to any great extent. In some instances, in beds of coal or ironstone of moderate thickness, the long wall method may be applied, even where there is little refuse with which to pack the empty spaces. In kirving coal there is always an amount of refuse to put in the gob, which assists to keep up the roof; but the presence of a great deal of rubbish is a great advantage when the seams are of more than average thickness. I am speaking of seams not exceeding 10 ft. in thickness; anything beyond that has to be wrought by special means. The principle of long wall working is very easily explained. Around the foot of the shaft (referring to the plan of a Scotch colliery) a large body of unwrought coal is left, and a couple of levels are driven out on the breadth of the coal (the levels in other workings being on the rise), and taking the coal between them in a stope-like form. And so in another diagram the workings are on the ascent or rise of the coal, and a drift is run out, which leads to a second pit, which is used for ventilation. The roof is kept up behind the men working on the face by means of props behind them.

It has been suggested that the putting in of props should be enforced by legislative enactment, and that no roof should be left unpropped for more than a certain distance; but having visited a great number of mines, I am strongly of opinion that any such enactment would be unwise, not to say futile and useless. The nature of roofs differs so materially in different districts, and sometimes in the same mines. Very often the men can work for a considerable distance with perfect security, while in other places a great many props have to be put in. Sometimes a roof will exhibit a number of circles, which are, in fact, the stems of fossil trees (Sigillaria) changed to hard shale or sandstone, or not unfrequently ironstone, and being of conical form and smooth surface are apt to fall without a moment's notice, and crush all beneath; and whenever this formation is observed, a prop ought immediately to be put under it. Suppose, however, we have an average kind of roof, there would be no special difficulty, and the props may be placed 8 or 10 ft. asunder, and on two rows alternately, thus · · · · · · · · · · The roof at the back of this will come down at shorter or longer intervals after the working of the coal, and the refuse and smalls will often be several feet in height, and fill up half the space. As a general rule, the roof breaks down not far behind the last row of props. The props themselves will for a long time be fit when taken from behind to set up again in front, but the lid-pieces are frequently smashed by the pressure. Working on the face in front of the protecting props the miners complete the holing of the coal, and then the pressure will often cause it to come down of itself, or it is broken down by wedges, or gunpowder, or hydraulic force, and it would be well if the latter were more frequently employed. The coal having been brought down it is removed, and then the men take down the back row of props, and set them in front on the face of the coal. The removal of the props is a matter of some danger, and has to be performed with judgment and quickness. They are generally pulled away by a chain or a rope fastened around each one near the foot, and sometimes when the pressure aloft has been great it is necessary to dig around the foot, and loosen it. There are, however, cases in which no amount of propping is enough to keep the men in real security, hence a plan has come into use in the North of England of building up pillars of chocks or nogs of timber, in pieces from 2 to 3½ ft. long by 2 or 3 in. square. These pillars are found to be exceedingly strong, and capable of sustaining a heavy roof pressure better than props, which are frequently driven by the weight into the soft floor. This, in a few words, is the principle of advancing the face of coal, whether that face runs in a long continuous line, or whether it is arranged in steps; and in Leicestershire the system is carried out with great success, with working faces from 300 to 800 yards in length.

I will say a word or two more on the subject of the boundary. It is, as I have before said, important whether the work is carried from the centre outwards, or whether a pair of levels is driven out to the bound, and the mass worked by "bringing the coal back," as it is called. According to choice made of these two plans the arrangement of the roads will be governed. If, as the work proceeds, we go further from the centre, we shall have to keep up the communication by means of branches or parallel roads; and the way of doing this is by packing the refuse material, and forming walls from 6 ft. to 12 ft. in thickness, and putting them in all shapes, so as to make the roof rest upon them. In this way the roads are kept open through the goaf or gob. The pressure of the superincumbent weight makes the floors of these roads puff up, sometimes to a great extent, and the creep has continually to be cut away. After a short time the roof, as well as the floor, will encroach on it, involving the continual employment of men to re-lay the rails and to cut away the roof, so as to keep it suitable for the passage of horses and other traffic. Sometimes it is found necessary to adopt the raised floor, and then a good deal of over-cutting will be required to obtain sufficient head room. In many cases, within a very short time, the pack walling may be pressed into a third of the height it originally had, and it will be so squeezed down as to be a source of constant danger. The expense, therefore, of keeping open these roads is considerable, and must always be kept in view when the question arises as to the plan of working to be decided on. In Staffordshire they have a system of leaving a certain thickness of coal alongside the levels to keep them in good condition as travelling roads; and their lines of road will be carried to the face of the work only when necessary, and no more be put in than is sufficient to bring away the material; the necessity of seeing that the walls, or ribs of coal, do not at any point give way being imperative. Where there is only a moderately good roof, the coal is brought along the face in hand-wagons, pushed by boys, until the road is reached, when it is then passed along to the shaft. When the roof is especially good, and they are enabled to lay down rails and put on tram-wagons, the work is greatly facilitated, and they are enabled to convey the coal along the face so economically that it is not necessary to have the roads so close, and they may be even as much as 30 or 40 yards apart. In cases of this kind, long wall working is by far the most advantageous. At Hetton, where the works were laid out at first on the post and stall plan, the pillars are got by the long wall system, otherwise it would be a most expensive operation to move the coal from the face of the roads, which are by this plan only 12 or 14 yards apart. The arrangement of the workings then will be found to vary somewhat according to circumstances, the principle remaining the same; and much, therefore, will depend upon the experience and judgment of the manager, who ought to be conversant with all variations which have been proved to be best for economy and security at the same time.

What is called "broad working" is only another form, which can scarcely be called a modification of the long wall system, although an important one. The pits being sunk levels are driven out to the boundary, and the coal being got adjacent to that line it is brought back to the shaft. In this plan there is a great advantage in leaving all the worked-out ground behind, and as the gas has a tendency to rise by its specific lightness it passes into the goaf, and is got rid of in the innumerable vacant spaces which are left in the broken material. In other systems the goafs containing these dangerous reservoirs of explosive gases must be continually traversed, while by this plan they are all left behind. Again, the only roads to be kept up are the narrow exploring drifts to the boundary, which being in the solid coal do not require any of the great expenditure required by the constantly changing character of the goaf in the maintenance of gob-roads. Wherever this plan can be carried out it will be found to have many advantages, particularly that of being very economical so far as the working and maintaining of the roads are concerned, and also that of greater security, inasmuch as the worked ground is left behind in a condition in which it can do no harm. There is, however, one palpable objection to it—that after sinking shafts and putting up engines, particularly if the district to be worked be large, shareholders will generally be unwilling to wait until drifts are carried to the farther end of the ground. Sinking the shaft alone may occupy two, or three, or four years, and then driving out levels of such a length may take some years more. So that if the lease be for (say) 21 years no man in his senses would defer getting coal for so long a proportion of the time, as the period left would be too short for him to recoup himself. Men are obliged, therefore, in self-defence to begin getting coal for the market as soon as they can after starting from the bottom of the shaft. To that reason may be attributed the objectionable plan of opening large spaces near the shafts, and considerations of this sort militate against the theoretical completeness and advantages of working back from the boundary.

There are several modifications of these forms of working which are well worth notice; such, for instance, as when stonework arching may be employed to protect the roadways. This is notably the case in South Wales, where it answers admirably, the only drawback being the great expense of it. Many cases occur in that district where the best timbering cannot be maintained for any length of time, and, therefore, arching is found to be absolutely necessary. Some modifications have been tried in the North of England during the last 20 years, but they have been very successful in all districts. The long wall plan has latterly been adopted at the Monkwearmouth Colliery, upon the celebrated Hutton seam. The shaft there is 280 fms. deep, and the temperature being 80° the difficulties of working are considerable; but, nevertheless, this system has been applied with success. Parallel roads are driven 30 yards asunder, and these roadways are 3 yards wide, kept open and secured by pack walls. Thus, there is never more than 14 yards to carry the coal along the face to the wagons, the men being protected chiefly by chocks, the pressure being exceedingly great. Although the character of the roof is such that it breaks down immediately behind the back row of props, there is a much smaller proportion of small coal made by this system than by that of leaving large pillars. Besides which they are able to remove the whole mass of coal, and by its greater simplicity of plan the ventilation is more effective and more easily managed. Besides all these advantages of the long wall system, it is probable that it is far more secure, as regards the lives of the men, than other systems.

Then, again, modifications have been introduced to meet the circumstances which have made the South Yorkshire coal fields so dangerous. The workings at Lund Hill and other collieries in that neighbourhood, which have been so productive of accidents, have been replaced by a system analogous to long wall working, which has been found of great advantage. In the Forest of Dean, on a seam of coal 11 ft. thick, which some years ago would hardly have been thought a suitable subject for working by long wall, two distinct systems are now in use, in both of which the necessity of driving narrow levels is got rid of. The roof at the face of the working is supported by props, and a slice being holed and taken down, the space kept for the roadway is packed on each side. The props being then taken away the roof comes down, leaving the roadway to a pressure resulting in a heave of the floor, which has to be cut away, while the roof also has to receive similar treatment, so that half the roadway will be in the roof, the original coal being compressed sometimes from 5 or 6 ft. to 1 ft. If we have a bed of chert in the middle of a seam of coal it is advisable to begin the holing in it. Thus, suppose we have a seam of coal of 50 ft., above that a layer of chert 3½ ft., and above that 3 ft. of coal, we must take out that beneath the chert first, and support the chert and top coal by chocks of wood, and then as the bottom coal is removed, taking down that above close up to the chocks. By this plan in the Forest of Dean they get a smaller proportion of slack than they would by any other means. In Scotland the long wall system is largely adopted. It is generally deemed preferable there to trust to a pack-wall than to coal for the roads, although the floor often heaves. The face of work often advances very irregularly, a good deal, probably, because of the irregular direction of the cleat, or, perhaps, because the coal works better on the end than on the face. The long wall system can be made so economical that in Somersetshire seams of coal as little as 30 in. are worked—indeed, I have seen a seam of 11 in. only worked by this method. For the same reason many of the pillar workings in Yorkshire have been transmogrified into the long wall system by advancing the bord gates, and enlarging the faces of work. The great length of gob roads to be kept in repair has been the main objection to the change, but that has been got over by driving a few yards uphill, and working a portion to go to goaf, thus making the two systems work into each other.

The long wall system is carried out in Lancashire, Nottinghamshire, South Derbyshire, Shropshire, in certain parts of Staffordshire, and in the Forest of Dean. Its introduction into the North of England has only made any way within the last few years, but it is now adopted in some of the Northumbrian and Durham mines. It is largely used in Westphalia, Saxony, and Belgium, varying much, no doubt, according to the different thickness of seams, their inclinations, and local circumstances. Indeed, the forms into which the workings may be thrown, and the modifications of which the system is capable, are innumerable, and it is therefore, impossible to lay down exact rules. The roadways up to the face of the coal, however, should not be more than 30 yards apart, as it is not desirable to have to drag more than 12 or 15 yards. The working by long wall should go on with a regular output; that is to say, that side by side with the quantity required for the market the work should advance regularly every day. Strikes of workmen, or a want of a sufficient sale, or water getting in, or anything which will interfere with this regularity, will be fatal to the satisfactory employment of the long wall system. It may be said, however, in conclusion, that where the long wall system has been introduced it has soon been admitted to have a decided advantage over pillar working, in the economy with which the coal can be worked, and in the cheapness with which it can be broken down, and in the proportion of large coal which is obtained, besides being much softer and better for the workmen.

THE SOUTH MIDLAND INSTITUTE OF ENGINEERS.

The annual meeting of the South Midland Institute of Mining, Civil, and Mechanical Engineers was held on Monday, at the rooms of the Institute, Wolverhampton, Mr. D. SKIDMORE (one of the Vice-Presidents) in the chair. The Chairman was supported by Mr. T. Rose, Mr. B. P. Walker, Mr. Glennie, Mr. T. Cope, Mr. Bromley, Mr. Stephen Watkins, Mr. Wendel Underwood, Mr. D. W. Lees (the secretary), and others.—The SECRETARY presented the annual report and financial statement, from which it appeared that the members numbered 133, and that there was a balance in hand of over 18*l.*

Mr. M. W. Peace, of the Coal Mining Association of Great Britain, was elected an hon. member; and Mr. D. Knowles and Mr. A. Croxall, both mining engineers, were elected ordinary members.

The voting for officers showed that Mr. Edward Jones, F.R.G.S., and Mining Engineer of the Lilleshall Company, of Granville Lodge, near Wellington, had been elected President, (vice Mr. J. P. Baker, H.M.'s Inspector of Mines, resigned); that the three Vice-Presidents were Mr. D. Skidmore, Mr. T. Rose, and Mr. John Brown; that the twelve members of the Council were Messrs. Bromley, A. Bowkley, Walter Ness, W. Underwood, B. P. Walker, W. Davis, J. Randall, E. Griffiths, W. Glennie, J. Laxton, S. Watkins, and W. Blakemore; that Mr. A. Morgan was the hon treasurer, and Mr. D. Lees the secretary.

During the scrutiny Mr. JOHN RANDALL, F.R.G.S., of Madeley, said—Of the policy and importance of institutions like this there can be but one opinion. The members of the South Midland Institute of Mining Engineers, or the majority of them at least, belong to a profession which is alike honorable and onerous, and which entails upon them as individuals high responsibilities. Mistakes made, from deficient information, erroneous judgment, or want of experience in such a profession affect not the interests of the persons making them merely, but the lives and the property of others. It is a profession which has special difficulties to contend with, and one which has less aid and less assistance to guide it than others. It is one, too, in which ordinary rules and information, even were these at command, would in very many instances be of no avail; for its members have dangers and difficulties to contend with which are as unseen as unexpected, and such as no prudence or foresight could ward off. Operations on the surface, and under it, are two different things. The work of the hammer-wielding geologist, in the bed of a brook, or on the hill-side, beneath the broad blue sky, is sport and play compared with the labour that has to be performed underground. One finds the country mapped out for him, and the strata geologically laid down: the other has to grope his way in the dark, amid the intricacies of nature, to work his way through accumulations of ancient forests, to contend with the effects of river currents, with the freaks of water and of fire, in their various forms. The surface geologist sees rocks and soils as they are undergoing transitions and modifications by the air, the rain, or by the agency of man; the other explores the primitive physical geography of the earth for himself, bit by bit, and it is by means of his researches that its details are chiefly made out. Even experience gained in one portion of the field fails to serve in another. The old foundation flooring of the great store-house of coal will rise up to cut off the continuity of the measures; for he finds that Nature, instead of removing the obstacle, had built round, not over it, as a builder sometimes presses into his service a block of stone that belonged to some former structure, although of quite a different material. Sometimes he finds that spurs from, or prolongations of, some old Silurian coast which had extended into a flat country on which the coal measures were being piled up, like that around which the measures wrap at the Heath and Lewisham pits, near West Bromwich and Sandwell Park. An undenuded ridge, which having resisted the destructive waters of the carboniferous period, is now supposed to extend from Herefordshire into Warwickshire, dividing the Staffordshire and Shropshire coal fields from that of Gloucestershire. On the problem as to the width of this old sea cliff, the Sandwell Park sinking may serve to throw some light. It is not far gratifying to find the strata dipping to the south-east; and it must be highly pleasing to the promoters and others actively engaged in this spirited undertaking to find that they have, at a depth of 110 yards, come upon fossil plants, indicative of an approach to a formation belonging to the period at which the earth became enriched with those great fuel treasures of which in this district we well know the value. It must be peculiarly gratifying to men practically engaged in digging and delving through hundreds of yards of red and purple sandstones, with no one familiar feature to recognise them by, to come upon well-known forms of vegetable life of the great coal-producing era. One can readily imagine that it would be with feelings akin to those a traveller would experience when, after pushing his way through an unknown and uncivilised country, he meets with familiar faces, and persons speaking a language he understands. But however encouraging such indications may be, they are in this case only so in a limited sense, as they throw no light at present upon the question the sinking has been undertaken to set at rest.

Mr. Randall assumed that his hearers had seen what appeared on this subject in the *Mining Journal* of last week. After quoting Mr. Holt's note appended to the account of the finding of the fossils, Mr. Randall continued:—

The original paragraph by itself is highly satisfactory, inasmuch as it in no way diminishes the hope the friends of the scheme have entertained; but the finding of fossil plants, even supposing that the stratum proves to be of the true coal measure series, by no means establishes the position assumed, a position which was questioned in a temperate and able paper read before the Institute by Mr. Laxton two years ago. Such plants are numerous in the upper and unproductive coal measures, as in the neighbourhood of Shatterford, where 800 ft. of such unproductive measures have been sunk through. The measures most likely to be missing are the lower and productive, not the upper and younger ones, which would naturally come in as the inequalities disappeared. What we all have to hope for, as I am sure we all do, is that the sinking is sufficiently removed from this old Silurian bank to allow of the productive coals to come in, and that a spirited enterprise will in this case be rewarded. Should this be so a large area will no doubt be opened up under the Permian and New Red Sandstones on the east, to swell the amount of the Coal Commissioners have calculated upon. One of the results of the Commission is that we have 3141 square miles of coal measures under the Permian, New Red, and Triassic rocks, or 301 square miles more of coal measures underneath these rocks—the presence of which on the surface was formerly sufficient to deter miners from further search—than we have of coal measures belonging to the old and exposed field. Whether the Commissioners have allowed in their calculations sufficient for displacement and removal by denudation or not I cannot say. In the discussion which took place in August, 1869, on my paper read before the members of the Society, I said I thought the evidences of the present day tended to show that the coal fields of South Staffordshire, Shropshire, and South Wales were undenuded portions only of one great original coal tract. Still more recent evidence goes to show that this great carboniferous deposit was even more extensive, that it extended from the South of Scotland through Central England to Wales, and in width through Belgium to Brittany and Central France. These coal tracts were separated by agencies of denudation. After the formation of the coal measures, and prior to that of the Permian strata, great disturbances for 800 miles in an east and westerly direction took place, tilting the coal measures, throwing those into troughs which have been saved to us, and others into ridges, from which they were consequently swept away. Now it happens, singularly enough, that just at the point where the foundation rocks of the coal measures come to the surface, and the lower coals themselves have been partially denuded, and these have again been overlaid by the younger measures, together with the Spirorbis limestone, near Broseley, that one of these crumpled up anticlinal lines occurs, whilst the Old Red Sandstone, with a seam of coal, sets in to the south. There is a succession of ridges or furrows in parallel lines, bringing up successive horizontal margins within reach of the influence of destructive waves. These erosive agencies may not have been altogether

different to those now in operation around us. And supposing they were not, what immense periods it indicates.

Mr. Randall then went on to state that Prof. Ramsay, in his report to the Coal Commission, took more favourable views of what was likely to be forthcoming than he had expressed in his paper to which he had already referred. Still he (Mr. Randall) had remarked that a better prospect might afterwards be opened up. He now found Prof. Ramsay saying that it was quite possible that two coal fields might be connected underground north-east from Sutton Maddock to Sutton coal field. Supposing that Prof. Ramsay was right, there was a considerable margin where coal might be looked for in the direction of Shifnal: but he rather feared that the Professor went a little too far to the east in fixing the line, and that, therefore, he was taking too favourable a view of the subject. Nevertheless, he (Mr. Randall) had always been of opinion that in a north-east direction there was a considerable margin extending from Cannock Chase in the direction of Newport, and from Newport in the direction of Mr. Coates's, at Woodcote. He did not think that Prof. Ramsay had taken a rather too flattering view of the edges of the coal field, and that there was not so much coal under the Red Sandstone as the Professor believed, taking a line from Sutton Maddock to Sutton coal field. The line should go much nearer that which he (Mr. Randall) had pointed out.

Mr. Randall was warmly thanked by the meeting for his valuable contribution.

Later in the day the members dined together. Mr. Skidmore was the Chairman, and Mr. T. Rose the vice-Chairman.

Mr. RANDALL, in proposing the toast of the evening, said that there never was a time in the history of this country when the mining interest had attached to it the same degree of importance that now characterised it. As now there was never so much tact and good management and skill and intelligence required to conduct mining operations so as at once to satisfy employers, to bring credit to the mining engineer, to meet the increasing requirements of legislation, and to protect the life of the working miner. It was satisfactory that with reference to other professions, at no other time was there ever so much information accumulated for the guidance of the members of the different interests. As to the mining engineers, however, as he had remarked earlier in the day, they had often to grope their way amidst difficulties by which no other profession was beset. Yet the mining engineers of Great Britain were pursuing their vocation with a success that laid the whole kingdom under obligation to them. The advance they had made in the economical, the skilful, and scientific winning of the fossil fuel and the mineral wealth of these isles bespoke a growing professional intelligence in every way honourable to their order. Institutes like the South Midland may have had some share in bringing this about; but whether they had or had not, now more than ever before such institutes were needed, and it behoved every member to do his utmost to make the Institute to which he belonged increasingly respected, because of the excellency of the work that it did. After touching briefly upon the past, and adverting to the result of the election that afternoon in respect of the first officer of the Institute, Mr. Randall anticipated that great usefulness and much prosperity would attend the future of the South Midland Institute of Mining, Civil, and Mechanical Engineers.

Mr. BERNARD P. WALKER most cordially endorsed the views that Mr. Randall had expressed. It was now absolutely necessary that everything that could possibly tend to facilitate knowledge in all the branches of science whose advancement was contemplated by that association should be pursued with the utmost diligence. There was much work yet to be done by the mining, the civil, and the mechanical engineer to keep himself abreast of the times, and the facilities for his progress were increasing. By the aid of the South Midland Institute he trusted that the members of those professions in that part of the kingdom might be aided in their researches. With the view of getting aid himself, as well as with a desire to commiunate for the general weal what he knew, he had attached himself to the Institute, for he had a firm conviction that its capability for good was very great. Never was that conviction stronger than now. All the help he was at all able to render would be cheerfully expended in its service, and he asked that every member, either by contributing papers or by contributing to the discussions, would display a professional patroitism that harmonised with the spirit of the times. Mr. Walker likewise spoke on behalf of kindred associations contributing to each others advancement by those interchanges and exchanges of courtesies and assistance that would largely increase their individual usefulness. (Applause.)

The VICE-CHAIRMAN gave the health of the President elect. Mr. Edward Jones had promised him that he would serve the Institute as its chief officer if he should be elected to it; and that gentleman's absence at the meeting and the dinner was no doubt due to the delicacy which they could all appreciate, that made him wish neither by his presence nor by the votes of his immediate friends, who otherwise would be sure to have accompanied him, to contribute to the bringing about of his own election. The very warm interest he (the speaker) felt in the South Midland Institute made him grateful to Mr. Jones for consenting to act as their President; for he felt that it was being honoured and served in an especial degree by Mr. Jones's assent. The President elect occupied a distinguished position in the geological world, and as the mining engineer of the great Lilleshall Company he discharged duties in the mining world second in importance to none discharged by any mining engineer in Great Britain. These facts were of themselves guarantee enough of Mr. Jones's paramount fitness for the Presidency. But when they remembered with what conspicuous success he had conducted the mining department of the vast concern of the Earl of Granville, together with the numerous and disinterested evidences that he had afforded of his best wishes for the prosperity of their Institute, the conclusion was irresistible that in Mr. Jones they had a President who gave the South Midland a distinction that it had never before acquired, and that guaranteed a conducting of its affairs which must wonderfully promote the objects for which the Institute was founded. Under the leadership of such a man as Mr. Jones, who was there in the whole district who would not feel it a great priviledge to act? In his other remarks the Vice-Chairman sympathised with the views of Mr. Walker, as to the interchange of civilities and courtesies with kindred societies. Nor did the rules in any way limit the qualifications of membership by reason of gentlemen being members of any other institute in South Staffordshire, or elsewhere. (Applause.)

Mr. STEPHEN WATKINS supported the vice-Chairman in the last sentiment. He spoke of the tact that was needed to the successful management of such an institute as their own, and rejoiced that, in addition to his numerous other attainments, that one was possessed by the President elect. Mr. Watkins, recalling former services rendered to the Institute by Mr. Randall, expressed the gratification he experienced at his presence, and at the disquisition by that gentleman earlier in the day; whilst he trusted that very frequently it might be the good fortune of the Institute to have Mr. Randall at their meetings. That such might be the case was happily more than ever likely, inasmuch as Mr. Randall was now one of the Council.

The Vice-Presidents were spoken of in the highest terms by Mr. Underwood and Mr. Bromley. The CHAIRMAN, in responding, expressed his determination to do his utmost for the Institute, and showed how personal feeling should be sunk when the interests of an association were at stake, at the same time that every encouragement should be afforded to those members who were the least privileged in scientific attainments, but nevertheless honestly desired to give the Institute the benefit of their practical knowledge.

Mr. BROMLEY, responding to the compliment passed to the Council of the past year on the proposition of Mr. Tolley and Mr. Deeley, dwelt upon the services that the Institute had rendered the mining interest generally by the action they had taken in conjunction with the Mining Institute of Great Britain upon the New Mines Regulation Bill. The Mining Institute received the suggestions adopted by the Institute most readily and with the utmost cordiality; and most of them had been incorporated into the Bill as amended, and now before the House of Commons. The Bill was not perfect, and would, no doubt, be yet much altered; but it would have been much more imperfect if it had not been for the course that the South Midland Institute had pursued. A permanent connection had now been established between them and the more important Institute by the making of Mr. Peace one of the honourable members of the South Midland. His (Mr. Bromley's) own labour and extra outlay in respect of the Mines Bill the Institute was welcome to; but the time he had given to that matter prevented him from taking up the Masters and Servants Bill, and the Public Health Bill—both of which, however, needed the action of the council, and would, he hoped, receive it.

The VICE-CHAIRMAN concurred in the importance of the two last mentioned measures being discussed by the council; and hence took occasion to point out the abundant work that lay before the Institute in the coming year.

The treasurer (Mr. A. Morgan), the secretary (Mr. D. W. Lees), and others were also complimented; and the proceedings closed with thanks to the Chairman.

THE DUDLEY MINING INSTITUTE.

An ordinary monthly meeting of the South Staffordshire and East Worcestershire Institute of Mining Engineers, and the first excursion of the members, took place on Monday. At noon the monthly meeting was held at the Geological Museum, Mechanics' Institute, Dudley. Mr. HENRY JOHNSON (the President) occupied the chair; Mr. Blakemore occupied the vice-chair, and there was a large attendance. After the reading of the minutes the following gentlemen were elected ordinary members of the Institute:—Mr. Jeremiah Gittens, mining engineer, Brockmoor; Mr. W. W. Heeley, furnace manager, Darlaston; Mr. G. Jones, ironmaster, Dixon's Green, Dudley; Mr. Samuel Growcutt, chartermaster; and Mr. George Hyde, contractor, Cosely. Mr. Holden and Mr. Mason were proposed as members. The President remarked, as an encouraging circumstancee, that 31 elections had taken place since Christmas.

Mr. THOMAS PARTON, F.G.S., read a paper on "Messrs. Winstanley and Barker's New Coal-Cutting Machine." The following is a technical description of the machine:—"The framework is from 5 ft. to 6 ft. in length, and is supported on flanged wheels, which run on the ordinary tramway of the mine. Only about half the upper portion of this framework is occupied by machinery, but the length already stated is necessary to provide room for the cutting-wheel when not in use; and, whether it is in use or not, the other half is very handy, for it furnishes a convenient place on which to store spare cutters and other articles which might be necessary on an emergency. On the front half of the framework are two oscillating cylinders, the pistons of which are worked by compressed air brought in iron pipes to the mouth of the drawing-road, and then conveyed to the machine by means of india-rubber tubing. These cylinders are provided with ordinary slide-valves, and the piston-rods are connected with an upright crank shaft, which revolves in bearings in the framework. At the bottom end of the crank shaft is a toothed pinion wheel, which is shrouded at the top. The teeth of this pinion gear fit into the teeth of a spur-wheel, which is also the cutting wheel, and is 3 ft. 6 in. in diameter. The knives, or cutters, are fixed on the periphery of the wheel, one in front of every tooth, the cutters projecting beyond the teeth from ¼ in. to 1 in. It will be seen that by this arragement the power is applied directly on the periphery of the cutting-wheel. The cutting-wheel revolves at the end of a broad plate or arm, which at the opposite extremity has a toothed segment and quadrant, actuated by a worm and hand-wheel. By this means the arm can be turned partly round in its bearing on the body of the machine." Surface arrangements: The compressed air is supplied by a horizontal engine, diameter of cylinder 16 in., and length of stroke 3 feet, and is forced into a receiver, in the shape of an ordinary longitudinal boiler, to a pressure of about 70 lbs. The air is taken in 4-in. pipes down the pit about 214 yards, and into the work by 2-in. pipes about 250 yards. The seam of coal into which the cutter works is called the "Pemberton Two-feet," and is considered one of the hardest coals in the Wigan district. The thickness is 2 ft. 5 in., and the length of face 120 yards. Mr. Parton here exhibited a plan showing the machine at work, and said its duty was to hole 3 ft. under and 3 in. of a cut the whole length of 120 yards between 6 P.M. and 4 A.M. It often happened that during the work pieces of coal fall off and block the wheels, and then the air was turned off whilst the obstruction was removed. After the machine had cut or holed a few yards the coals could be heard breaking off in large masses. When necessary the man at the machine could put up props without staying the progress of the machine. During the day the loaders were at work clearing away, so that the "Iron Man," as it was called, might repeat its work in the night. Two men were only required for the machine, one at the wince and the other at the machine. The proprietors had assured him (Mr. Parton) that in six months the machine had scarcely wanted repairing. The advantages of the machine might be summed up as follows:—That it will cut coal that men refuse to work at on account of its hardness; that it produces less slack; and that it renders less men necessary, less liability of accident and more certainty of production.

Mr. PARTON said he had received further information since his paper was written, and it was to the effect that the machine had been at work for fourteen months; that the contract for getting coal was 3d. per ton less than by hand labour, which was put against the cost of pumping air; the difference in proportion of coals and slack in favour of the machine was equal to 8d. por ton clear profit; and that under favourable circumstances the saving over manual labour would be 25 to 30 per cent.

A vote of thanks was passed to Mr. Parton for his paper, on the motion of Mr. JOHNSON, who said the time did not appear to be far distant when such a machine would be wanted.——Mr. BLAKEMORE, the Vice-President, said the machine was being introduced into the Cannock Chase district, but he had heard that a more modern one had been introduced.——Mr. PARTON, in replying, said Mr. Fiddler, one of the partners in the colliery, had offered to send the machine into this district.

The PRESIDENT exhibited the specimens of fossil flora from the sinkings at Sandwell Park Colliery, and the members minutely examined them. They agreed in the opinion of the President that the fossils proved that the strata were indicative of coal.——Mr. MINTON having presented to the Institute a section and complete collection of specimens of all the strata sunk through at the Grace Mary Pits, which the company were about to visit, it was agreed to have a case made for the collection, and a vote of thanks was passed to Mr. Minton for his gift.

The party then proceeded by omnibus, brakes, cabs, and cars to the Grace Mary Colliery, belonging to Mr. Samuel Minton. The "Grace Mary" is a model colliery, and is situated near the summit of the Rowley Hills, from whence the well-known Rowley rag—the latter word being a corruption of Registone—is obtained. After "doing" the pit, the members of the Institute were entertained at dinner by Mr. Minton and his partner, Mr. Bett, in a large tent on one of the slopes of the Rowley Hills. Mr. Minton occupied the chair, and he was supported by the President of the Institute, whilst the vice-chairs were occupied by Mr. Blakemore and Mr. Peacock. The toasts proposed were "The Queen," "The President of the Institute," "Mr. W. North, the agent of the colliery," "The Press," "Success to the Coal and Iron Trades," "Success to the Dudley Institute," "Mr. Minton," "Mr. Bett," &c. Mr. Minton gave an account of his explorations, and praised the Institute as an association which enabled enterprise to be successful; and Mr. Johnson extolled the enterprise of the entertainer.

DUDLEY AND MIDLAND GEOLOGICAL AND SCIENTIFIC SOCIETY.

The annual meeting of members was held on Tuesday, at Dudley. The President, Prof. RAMSAY, F.R.S., occupied the chair, and there was a large attendance. One of the hon. secs., Mr. W. MADELEY, read the report of the committee for the past year. Considering the importance of geological knowledge in the development of the industries of the district, the committee thought the usefulness of the society might be considerably increased. The committee wished that all coalmasters, or their agents, would present to the society all sections of pits sunk in the neighbourhood, particularly of pits sunk on the present known boundary of the South Staffordshire coal field. It was the duty of the members to obtain and disseminate as much as possible information as to the relationship of the coal measures to the newer rocks of the Permian and Triassic age. The committee, therefore, hailed with pleasure the fact that Prof. Ramsay had consented to address the annual meeting on the important subject of the existence of coal beneath these rocks.

Upon the motion of Mr. MADELEY, seconded by Mr. E. TERRY, Mr. E. F. Smith was elected president. The proposer of the resolution spoke of the warm interest which Mr. Smith had always felt in the society.——Mr. ELLIOT HOLLIER proposed the following list of vice-presidents:—Mr. S. Allport, F.G.S., Mr. J. P. Baker (Government Inspector), Mr. C. Cochrane, Major Fletcher, M.A., F.G.S., Dr. Fraser, Mr. B. Gibbons, Mr. Rupert Kettle, Prof. Ramsay, Mr. F. S. Shenstone, Mr. E. F. Smith, Rev. J. H. Thompson, Mr. G. Taylor, and Mr. Twamley. This list was carried. After the election of a committee, Mr. E. Terry was elected treasurer, and Mr. Madeley secretary. After several formal votes, one of thanks was unanimously passed to Mr. Madeley and Mr. Terry as hon. secretaries.

Prof. RAMSAY then delivered his address on "The Existence of Coal beneath the New Red and Permian Strata." The learned professor, in a long address, expressed his firm opinion that the majority of the coal fields of this country had been joined together in one large area, and that by various changes, such as downthrow and other faults, the fields had been separated, but that the intervening spaces covered the coal which had been still further buried by the forces which brought about the separation. Some of the coal had been buried so deep that it was not possible to work it at a profit, or ever would be, and some of it was too thin, although at workable depths, to induce anyone to bore for it. He believed, however, that considerably more coal lay concealed at workable depths than appeared in the fields. The South Staffordshire field was supposed to contain 3,201,672,216 tons of coal, but beneath the Permian attached were 10,380,000,000 tons; the Warwickshire field contained 458,652,714 tons of coal, but the concealed coal should be put down at 2,494,000,000, or nearly five times as much; and the Leicestershire coal field contained 836,799,734 tons, but beneath the Permian were 1,790,000,000 tons of coal. Prof. Ramsay pointed out that most of the information he had mentioned that day had been published by the Royal Coal Commission, on which he had been engaged.

In proposing a vote of thanks to Prof. Ramsay, Dr. FRASER alluded to the President's high position, and trusted he might long hold the distinguished chair to which his talents had elevated him, It was reading a little book of the Professor's many years ago that induced him (the speaker) to study geology.——The vote having been passed with acclamation, Prof. RAMSAY replied, and stated that the writing of the book alluded to had placed him in the proud position so recently occupied by a now deceased geologist, who was foremost in his age. The book attracted some little notice, and it was to its publication and the encouragement he thereby received, that he was enabled to come before them that day in his present position, and meet a gentleman who had become a geologist through his agency.

The company was then conveyed by numerous vehicles to the large limestone pits belonging to Messrs. Dixon, at Dudley Port. Here they were met by Mr. Bristow and Mr. Peacock, the manager and surveyor, and conducted by those gentlemen through the vast workings. The underground was thoroughly illuminated, and thus the visitors were enabled to judge of the result of 20 years continuous working in solid limestone. After the party had thoroughly inspected the pit, votes of thanks were passed to the proprietors, and to Messrs. Bristow and Peacock, for their courteous guidance through the works.

STATISTICS OF ALL THE COUNTRIES IN THE WORLD.—Under this title an English edition of Dr. Hübner's Table showing the area, form of Government, head of State, population, expenditure, debt, paper money, standing army and navy, railways, &c., of the various countries, has just been published (through Mr. E. Stanford, of Charing-cross) by Mr. H. S. Edwards. The table contains sufficient material to permit of a fair general idea of the position of the several countries being formed. In England each family is taxed to the extent of 1*l.* 1*s.* per annum for the support of the army and navy; in Prussia each family is taxed 1*l.* 16*s.* per annum for the same purpose. The table is well worthy of perusal.

IMPROVED HOT-BLAST STOVES.—According to the invention of Messrs. JONES, ironmasters, of Dudley, the vertical pipes through which the blast passes, and by which it is heated, are arranged around one or more vertical hollow columns or flues, the said blast pipes being situated in a vertical or tubular chamber formed by the said hollow column or columns and the outer brick of the stove. The waste heat from the blast-furnace or flame from independent fires enters near the bottom of the chamber, and ascends therein and passes around and about the blast pipes, a portion of the flame striking obliquely against the pipes, and giving a rotary or circulating motion to the flame around the pipes. The flame and heated air pass out at the top of the chamber and are conducted by flues into the central hollow column or flue, down which they descend. The said column or flue is thereby intensely heated, and its heat radiates unto the blast-pipes and contributes largely to the heating of the blast. The descending current of the flame and heated air is finally conducted by a horizontal flue to the chimney stack.

Meetings of Mining Companies.

WEST WHEAL SETON MINING COMPANY.

A general meeting of shareholders was held at the account-house, on the mine, on Tuesday,—Mr. B. MATTHEWS in the chair.

The usual preliminaries having been disposed of, the report and statement of accounts were submitted.

The accounts for the eight weeks ending April 27 showed—Ore sold, 451*l.* 3*s.* 6*d.*—Wages, 279*l.* 2*s.*; merchants' bills and coals, 97*l.* 9*s.* 11*d.*; dues, 30*l.* 12*s.* 1*d.*: leaving a profit of 43*l.* 19*s.* 6*d.* Adding this profit to the balance to the end of February gave an available balance of 129*l.* 15*s.*, out of which a dividend of 80*l.* (2*l.* per share) was declared, and 49*l.* 15*s.* was carried to the credit of the next account.

Capts. M. Bath, J. Jennings, and W. Pascoe reported favourably upon the various points of operation. They have holed Michell's shaft to the 110 by a borer-hole; to square down and complete will take about a fortnight more; they will then at once put in skip-road from the surface. While this work is being done they will go on with the completion of the shaft through stulls, &c., to the 120.

The CHAIRMAN congratulated the shareholders upon the prosperous position of the enterprise, and especially upon the circumstance that that prosperity was likely to continue. The amount of copper ores sold on May 2 and June 6, to come to the credit of the accounts to be presented to the meeting in August, is 35*36l.* 11*s.* 1*d.*, and he anticipated that the amount of tin would be 30*0l.* in excess of the amount credited to-day. He could not permit the present opportunity to pass without offering a few remarks upon what the mine had already done. This was the 18th anniversary of the mine paying dividends, and the 2*l.* per share which they would declare to-day was the 108th consecutive dividend paid every two months. The total proceeds of the mine from Oct. 12, 1848, to June 8, 1872, amounted to 661,390*l.* 3*s.* 8*d.*, out of which they had paid 41,087*l.* 0*s.* 3*d.* for dues, leaving 617,303*l.* 3*s.* 5*d.* as the net returns from the mine. They had paid in labour cost from May, 1844, to the end of April, 1872, both inclusive, 404,003*l.* 8*s.* 5*d.*, leaving a profit on the working of the mine of 213,299*l.* 15*s.* Now, the dividends paid to the shareholders had amounted to 231,800*l.*, so that they had received back the whole of their original outlay, and 212,800*l.* in addition, and still had a balance of 499*l.* 15*s.* in hand, and a good property in their possession, which would long yield them a large amount of profit; or in other words, the 19,000*l.* invested in 1844 had given an average profit of about 45 per cent. per annum ever since, and was likely long to continue to do so. He concluded by formally moving that the accounts be allowed and passed.

The report and accounts were then unanimously received and adopted; and the declaration of the dividend agreed to, the proceedings terminating with the usual votes of thanks.

TRESELLYN TIN MINING COMPANY (LIMITED).

The first ordinary general meeting was held at the company's office, Harrington-street, Liverpool, on Monday, and was attended by a large and influential body of the shareholders,—Mr. EDWARD CROSLAND (the Chairman of the board of directors) presided.

The notice convening the meeting having been read by the Secretary,

The CHAIRMAN reported the result of the inspection of the property by the directors, read the agent's report, which was highly satisfactory, and entered into detail as to the prospects of the mine; and also reported that stamping machinery, with the latest improvements, had been ordered, and would soon be delivered; and stated that he believed sufficient tin would be stamped and sold to enable a dividend to be declared by the end of the present year.

The following report from the agent was read to the meeting:—

June 8.—In handing you my report of this mine I have to congratulate you upon the discoveries made in costeaning and other operations since its commencement. No. 1 lode is 5 ft. wide, well defined, strong, and of congenial character, producing rich tinstuff. We have commenced to sink our trial shaft on this lode, which I hope to have cut down to a proper size, collared up, and ready to commence sinking below the present bottom by Wednesday next; and should the lode continue as at present, of which there is every prospect, I shall soon be in a position to be able to report very satisfactory progress on this lode. No. 2 lode we have also opened on 30 fms. to the north of the former, which is about 4 ft. wide, of a highly promising character, and from which we have raised some excellent quality tinstuff. I intend to give this lode a further trial by sinking a few fathoms deeper as soon as we have erected the necessary facilities for progress. I purpose sampling the lode in the adit level, so as to ascertain its quality, and see if it affords a sufficient profit over cost of stoping, stamping, and dressing for the market, which I believe will be a valuable acquisition to the mine, as we have nearly 30 fms. of backs now standing for 90 fms. in length. The new south lode we still continue to open on further, so as to ascertain its character, size, and bearing. Some of the lode containing tin from one of the pits I have forwarded by Mr. Bawden, which is of a most congenial character for yielding large quantities of tin at a deeper point of development. I purpose also to continue our costeaning operations to the north boundary to open out all the lodes we have in our sett, as we are positive there are other lodes to the north of those already opened on. I find by diverging our stream of water further north, it will admit of being brought in at an height of over 30 fms., so as to work two water-wheels, stamping, and requisite machinery which will enable us to lay out dressing-floors with a good fall, and to much advantage. I have advertised for a good mine carpenter and a smith, and hope shortly to engage them, and to push forward the needful erections so as to commence dressing and make sales of tin. We calculate we have on the mine about 500 tons of good quality tinstuff for the stamps. In closing my report I beg to say the more I see of this valuable property the better I am pleased with it; and I am using every effort on my part to lay open the mine to the best possible advantage for the benefit of the shareholders.—J. HODGE.

The retiring directors were re-elected, with the addition of Mr. W. Newby Fraser, of Liverpool.

A vote of thanks to the directors and officers of the company was unanimously passed, which terminated the proceedings.

WHEAL PEEVOR MINING COMPANY.

The first general meeting of shareholders was held at the account-house on the mine on Tuesday,

Mr. THOMAS PRYOR, purser, in the chair.

The statement of accounts to date showed that there had been expenditure for mine cost, 845*l.* 6*s.* 4*d.*; merchants' bills, 90*l.*; paid promoters, 50*l.*; materials, &c., 120*l.*=1924*l.* 6*s.* 4*d.* Calls, 1500*l.*; ore sold, 75*l.* 7*s.* 6*d.*; leaving debit balance 348*l.* 18*s.* 10*d.* The only liability was 90*l.*, to meet which the assets were—to receive for tinstuff sold, 53*l.* 19*s.* 3*d.*; and cash at bankers, 50*5l.* 1*s.* 11*d.*; leaving debit balance, as above, 348*l.* 18*s.* 10*d.*

Mr. DABB was much pleased with the clear and business-like way their purser had presented his accounts. He only wished all the pursers in the county would adopt the same principle at their general meetings, by placing before the shareholders a balance-sheet of their assets and liabilities, when every shareholder could see for himself the exact position of their affairs. He had much pleasure in proposing that the accounts as read be passed and circulated in the usual way, and that a call of 10*s.* per share be made. No doubt, several of the shareholders had, like himself, seen the letter in the *Mining Journal* libelling the officials of this mine, and he thought they were in duty bound to them to say that he was sure that letter was read with contempt by all who knew their purser and the other members of their staff of officials. It was evidently written by someone out of pure spleen; but he thought if "Philanthropist" were at that meeting, and saw what had been done with their money, he would quickly change his mode of writing. He represented a large shareholder, and although he had not sent in one penny-worth of supplies to the mine, he must say that in going through the accounts that day the shareholders had every reason to congratulate themselves on the very low rates at which they had purchased their plant.

Mr. JOHN TREGONING (Truro) said he fully indorsed all that Mr. Dabb had said about the necessity of laying before the shareholders as full a statement of accounts as that now laid before them. He must say he was agreeably disappointed to see so much work done in so short a time, and he thought their agents were all entitled to their best thanks for this, and for having purchased such a valuable lot of machinery on such reasonable terms. He had much pleasure in seconding that a call of 10*s.* per share be made, which would pay off their debt and leave about 1100*l.* to go on with.

The purser then read the report of the agents, which was a highly encouraging one.

Capt. ROGERS (the manager), in reply to several shareholders, said the more he saw of the lode, which was well known to be the champion one of the district, the more he was convinced that they would have a great mine in Peevor. He pointed out the workings by a section of the mine which had been copied from one which Mr. John Michael Williams had in his possession. From the marginal notes on this section it appears the best course of tin was in the bottom of the mine. They were pushing on their work as rapidly as possible, and by the end of the present week they would have the whim engine-house up, and before another meeting no doubt they should have their pumping engine-house up, as they had stone in the sett, and having purchased the engine-houses at North Downs they would have no difficulty about keeping their masons going with granite. They had, he thought, purchased their pitwork, winding-engine, boilers, &c., very cheap, compared with existing prices. They sold last week about 80 tons of tin in the stone, which realised about 20*s.* per ton, which he thought a capital price when it was taken into consideration the great deductions the tin buyers always made for returning charges, carriage, &c. They had a large quantity of tinstone on the mine, as the shareholders could see, but he would prefer keeping it until they were ready to stamp it rather than sell to the bargain buyers at such a heavy sacrifice. As soon as their winding-engine was at work they would be in a position to send up an immense quantity of tinstuff, which was the best criterion of the mine. The shareholders must not, however, expect very large returns of tin until they got to the bottom of the mine, which he assured them every effort would be used to do.

The PURSER said the next matter they had to discuss was a pumping engine. He had advertised for one, but had not received a single offer, except the one from Messrs. J. C. Lanyon and Son for the 60 at North Downs, and this he only received on Thursday last. It was known in that room that Mr. Lanyon had purchased the whole of the plant at North Downs after a sharp competition, as he (the purser) fully intended to have purchased them himself, and to offer at cost price what machinery the Peevor Company wanted. Some little time after this sale he said to Mr. Lanyon he wanted the 60 for Peevor, when Mr. Lanyon informed him that he intended the engine for Creegbrawse, if one were erected at that mine, but if they did not have it we should have the first chance of it at a price that was then named, and he thought that Mr. Lanyon had acted in a very straightforward and liberal manner towards them, as the Creegbrawse Company decided not to put up the engine, and Mr. Lanyon had since offered it to them at the original price of 540*l.*, which he considered cheap, and which he should recommend the company to accept.——Several shareholders having spoken in favour of Mr. Lanyon's offer, and of the liberal manner he had treated the company, it was unanimously agreed that the offer be accepted.

Mr. LOCKETT said he believed he was the only person present who had seen any levels below the deep adit, and as he thought that some of the shareholders would

like to know something about the lode that he had seen some years since in the bottom of the 40, when the water was drained by Great North Downs, he had much pleasure in telling them he was working in little North Downs, when some of the men told him that the 40 was dry at Peevor; he immediately went underground, and saw a splendid lode of tin, which some of the men valued at 6d. per lb. in the stone. Tin was then about 40*l.* per ton. He believed that as soon as the water was forked out of the mine they would find in Peevor a mine that would equal all their most sanguine expectations.

The PURSER said he was much pleased to see such a large attendance of shareholders present, and that matters in reference to the mine and its management had been so fully discussed. He and his immediate friends held a large interest in the mine, and they were determined to see the bottom as quickly as possible. He had heard the opinions, he might say, of scores of agents about the great value of their sett, but he believed that none of them knew as much of their property as the late Sir William Williams, who many years since, to his knowledge, offered 6000*l.* for the sett. The shareholders might rest assured that every effort would be used to have their engine up before another meeting. They did not like to work their mine at the expense of their neighbour, Great North Downs, or what is now called "Rose United," but they could not disguise the fact that the Peevor Company would be greatly benefitted by that mine. He might mention that from February 24th to 10th June, he had registered no less than 416 transfers, which represented nearly 6000 shares, or double the number in which the mine was divided.

The meeting was largely attended, upwards of 40 shareholders being present, and terminated with the usual votes of thanks.

CWM DWYFOR COPPER AND SILVER-LEAD MINES COMPANY.

A general meeting of shareholders was held at the offices, St. Clement's House, Clement's-lane, on Wednesday,

Mr. JOSEPH HOPGOOD in the chair.

Mr. GEORGE J. GRAY (the secretary) read the notice convening the meeting.

The report of the directors states that they have the satisfaction of reporting that the recent discovery of silver-lead is daily increasing in importance, the lode having now been laid open at the surface for a length of 164 ft., carrying lead from end to end, as stated in the last report from Capt. Henwood, the leader varying from 3 in. to 18 in. in width. In the western end the lode is covered with debris to the extent of 10 or 12 ft., and in that direction the ground appears to be changing into the slate formation, and the lode presents the most congenial features for a large deposit of lead. There are also in this portion of the mines two very fine copper lodes, and another lead lode, all within a breadth of 60 yards, and there is every reason to expect, at even very shallow workings, large deposits of both lead and copper. A fine stone of lead, 160 lbs. in weight, was broken from the western end of the lode within the last week, and is now at the company's offices. It is not intended to operate further on the new lode at surface, which has now been so thoroughly explored. For the purpose of intersecting the four lodes, and for permanent working, a main shaft has been commenced a few yards further west, in the centre of the four lodes. These lodes will all, therefore, be intersected and proved at a few fathoms in depth. The erection of the water-wheel, which is now in progress, had been suspended until the main features of the new lode should have been developed, so as to ensure the placing of the wheel in a proper position. The deep adit level, which will intersect these lodes at a depth of from 70 to 80 yards, is being driven as fast as possible, and the No. level, on the Great Northern copper lode, is extended several fathoms towards the shoot of ore gone down on that lode in the old men's workings. The capital of the company being only 12,500*l.*, very moderate returns of ore will pay large dividends, and the directors have no doubt of raising, in the course of the present year, sufficient lead and copper to pay a good dividend, and to satisfy the shareholders that they possess in these mines a property of great value, unique in many of its features, and capable of making large returns for a long period of time, without any other machinery than what is necessary for crushing and dressing the ores. Since the balance-sheet was made up 2606 additional shares have been allotted, making a total of 10,075 appropriated, and there remain, therefore, to be issued 2425 shares, respecting the issue of which, and the premium at which they should be issued, the directors desire to consult the shareholders. The Bill for the railway to Portmadoc has passed the House of Lords, and has been read a first time in the Commons, and may be expected very shortly to become law. As this line commences at the mouth of the deep adit level, and will run to the ship's side at Portmadoc, its value to the mines cannot be over estimated. The directors invite the shareholders to subscribe towards the capital for the construction of the railway, with which the interests of this company are so completely identified. The full benefit of the railway will be enjoyed by the mines, without this company having been called upon, as a company, to contribute anything towards its formation.

The CHAIRMAN said he had presided over many general meetings of shareholders; but he had never had greater pleasure in addressing a body of proprietors than upon the present occasion, because it afforded him an opportunity of congratulating them upon the possession of a really valuable property. When the mine was commenced, some four years since, there was the greatest difficulty in obtaining capital to properly develope the mine; and the company would not now have been in its present financial position had it not been for their worthy managing director, who at his own risk expended 500*l.* in advertising for the necessary additional capital. Had that appeal not been responded to, Mr. Harvey would have lost the whole of the 500*l.*; and as it was, he did not gain anything, except as a large shareholder he had ensured the development of the mine. The question to be decided was with reference to the unallotted shares, the feeling of the board being that it would be a pity to further weight the capital unless it were absolutely necessary, the more especially as the value of the mine had sprung up from 10,000*l.* to more than 50,000*l.*, and it would be presently probably much more. The contemplated railway would enable them to convey the ores from the mouth of the level to the port of shipment for about 2*s.* 6*d.* per ton. It was the interest of every shareholder in this mine to do all in his power to promote the completion of that railway, for the sooner it was completed the sooner would the Cwm Dwyfor return dividends to its shareholders. He then moved that the report and balance-sheet be received and adopted.

Mr. STEWART seconded the proposition.

The CHAIRMAN, in reply to a question, stated that the balance-sheet now submitted embraced the whole of the accounts from the beginning of the company.

The AUDITOR explained that the item for management included salary, rent, printing, incidental expenses, directors' and auditors' fees, and travelling.

Mr. THOMAS HARVEY said that from the commencement of the company up to the present time almost every official of the company had received his claims in shares, and not in cash. When the mine was at its lowest state, and the shares were not so readily absorbed as they had been since, everybody who had a claim upon the company accepted shares in lieu of payment. When he found it extremely difficult to get capital to keep the mine going, he became responsible for the sum of 500*l.* for advertising that which he knew to be one of the best properties in which capital could be invested. This anticipation had been more than realised. He returned from the mine about a fortnight since, when he brought with him the stone of lead ore now lying on the table, weighing 160 lbs. Previous to the new discovery having been made, he considered the mine likely to be as profitable as any in which capital could be invested; but since this discovery success was rendered a greater certainty than anything ever seen in any property at a similar depth. The evidences near the surface were thoroughly satisfactory, and there could be no doubt whatever that large quantities of mineral would be met with in depth, whether copper or lead he did not pretend to say. He then proceeded to describe the various workings, during which he stated that all practical men who had seen the mine had come to the conclusion that in depth there would be an enormous deposit of mineral. One lode had been traced for 176 ft. in length of solid lead, and wherever such large cubes were found thrown up near the surface a lode of great power and magnitude always developed itself in depth. Lead lodes in general made up to surface in a sort of saddle, and dipped away and lengthened in their course in depth. The pummel of their saddle was about 176 ft. in length, producing from 3 to 5 tons per fathom for a great portion of the length. The lead upon assay produced 79 per cent. of lead and 3 ozs. of silver per ton, and the copper 24 per cent. of copper and 14 ozs. of silver, making the lead ore worth 15*l.* and the copper ore 20*l.* per ton, so that it was not a matter of much consequence whether the deposit in depth be lead or copper. Five copper and two lead lodes had already been discovered, and he believed the mine contained no less than 20. The water-wheel was being erected, and arrangements were in progress for the erection of dressing machinery.

A SHAREHOLDER suggested that the unallotted shares should be allotted to those only who agreed to take shares in the railway company.

Mr. HARVEY said the railway had never been offered to the public. It was one of the most promising enterprises ever introduced. The entire work was not likely to cost more than 15,000*l.*

A SHAREHOLDER asked when the mine was likely to pay dividends?

Mr. HARVEY said the moment they got the shaft down, and levels were driven, large returns would be made, and dividends declared.

Mr. GEORGE HENWOOD, M.E., stated that after the lucid explanation given by Mr. Harvey it would be unnecessary for him to say more than a very few words. He could only confirm in every particular the very satisfactory account of the mines both geologically and otherwise given by him. He believed the mines were not only likely to be most valuable, but had been proved so at present. He had to congratulate the shareholders on possessing a mine with such undoubted prospects of success. In answer to a shareholder, Mr. Henwood said he considered the mines worth from present prospects 50,000*l.* or 60,000*l.*, and that if he were a shareholder he would not sell any shares at less than 5*l.* each.

The following report was then read:—

June 11.—In reporting upon these mines, I beg to state that the sinking of the engine-shaft has been resumed at the original site. As soon as the rock at the bottom is squared the timber will be fixed. The progress of this shaft will be rather slow, as the rock is a lingula grit. But in sinking in the slate formation no time would be gained, as the cross-cut would have to be driven through this rock, and occupy more time, independent of expense, to lay open the various veins. The face of the lead lode has been laid open about 176 ft. in length, averaging from 11 to 6 ft. in depth; the leader is from 3 to 15 in. wide, solid lead. An open cutting is being carried up 22 *fms.* long, which will unwater the lode from 3 to 3½ fathoms deep. The sinking of the engine-shaft will be prosecuted with all possible dispatch. But in order that the men may work night and day, it will be necessary to erect a wooden shed over it to protect them. I need not particularise the character of the lead and copper lodes at this point, as you are well acquainted with the same. The deep cross-cut to intersect has been carried on as follows:—14 *fms.* open cut and 11 fms. close driving. There are three known bands of these grits in the neighbourhood of the mine. I believe the one where the veins of lead and copper have been discovered to be the most northerly; therefore, there cannot be a question but what in driving this cross-cut furtherdi scoveries will be made, as the whole of these bands produce both lead and copper ores. On the copper lode, No. 2 cross-cut is being driven further north, to ascertain if the whole of the lode has been intersected. The character of this lode is similar to what has been of late described. Every effort will be made to sink the shaft and erect the machinery without delay. This being accomplished, and the lodes laid open, there cannot be a doubt but what an abundance of both lead and copper ore will be produced.—THOMAS COLLIVER.

It was moved by the Chairman, and seconded by Mr. Mason, and carried unanimously, "That Mr. James Stewart, the retiring director, be and he is hereby re-elected a director of this company." It was moved by Mr. Stewart, seconded by Mr. Harvey, and carried unanimously, "That Mr. Joseph Pool be and he is hereby elected a director of this company." It was moved by the Chairman, seconded by Mr. Stewart, and carried unanimously, "That Mr. Christopher Yates be and he is hereby elected a director of this company." It was moved by the Chairman, seconded by Colonel J. A. Cole, and carried unanimously, "That Mr. Edward Brooks be and he is hereby re-elected auditor for the ensuing year, and that his remuneration be 10*l.* 10*s.*"

It was moved by the Chairman, "That 1000 of the 2425 remaining unallotted shares be issued, and that the directors be and they are hereby empowered to issue the same at not less than 4*l.* per share, being 3*l.* premium, and that in the first instance such shares be offered to the present shareholders *pro rata* according to the number of shares already held by them."——Mr. Harvey seconded the motion. Messrs. S. W. Smith and W. Kirton spoke in reference to the resolution. The Chairman having put the same to the meeting it was carried unanimously.

It was moved by the Chairman, seconded by Mr. Kirton, and carried unanimously, "That a special vote of thanks be given to Mr. Thomas Harvey, the managing director, for the great energy and ability evinced by him in promoting and furthering the company's interests."

It was moved by the Chairman, seconded by Mr. Stewart, and carried unanimously, "That a vote of thanks be given to Mr. Gray, the secretary, for the discharge of his duties on behalf of the company." It was moved by Colonel J. A. Cole, seconded by Mr. Harvey, and carried unanimously, "That a vote of thanks be given to Mr. George Henwood for the able reports upon the mine furnished by him from time to time." It was moved by Mr. Kirton, seconded by Mr. Stewart, and carried unanimously, "That the thanks of the meeting be given to Mr. Hopgood, the Chairman, for his able conduct in the chair."

PATENT GUNPOWDER COMPANY.

The statutory meeting was held at the Cannon-street Hotel, on Wednesday, Mr. JOHN OGLE in the chair.

Mr. W. T. JENNINGS (the secretary) read the notice convening the meeting.

The CHAIRMAN, after referring to the fact that the whole of the shares held had been allotted, mentioned that the Stock Exchange Committee had not only granted the company a settlement, but also a quotation. Their engineer had fortunately secured large and advantageous premises, accompanied with a gunpowder license, which was a very difficult thing to obtain. The company said there was no danger whatever in the powder it manufactured, but they had got to convince the public of that fact, the more particularly as the same statement was made concerning gun-cotton, which, unfortunately experience had proved to be incorrect. They were preparing to commence business upon an extensive scale; and it was only a question of machinery to extend the works to any possible extent that the demands for the powder may make it necessary. The directors had no hesitation in stating that the experience they have had since the prospectus was issued enabled them to say that the statements made were fully confirmed, and that from all subsequent trials the results set forth had been exceeded, more particularly as to the comparative strength between it and gunpowder. In every instance where samples had been given they had been followed by orders, which at present could not be executed; and from the nature of the orders it would be a long time before they required to book others. Among others, Major General Burn, of the Spanish Hematite Ore Company, had tested it, who states that it is not only perfectly safe to use, but that it is just twelve times the strength of gunpowder. One of the directors had been on the Continent, and had obtained the authority of the Austrian Government to the granting of a commissioner to examine the patent gunpowder.

A SHAREHOLDER asked the difference between this and the Patent Cotton Powder Company?——The CHAIRMAN said the Patent Gunpowder Company professed to obtain greater power, but the first principle in which there was such great superiority was in the fact that the base was so much cheaper.

Lieut.-Colonel Benjamin Mulenerer was elected director, and Messrs. Johnson, Cooper, Wintle, and Co. were re-elected auditors.

The CHAIRMAN, in reply to a question, stated that next general meeting was not due till July, 1873, but the directors hoped that long before that period a meeting would be convened for the purpose of declaring a dividend. Mr. Bennett said this company was not brought out upon an ideal value. Some persons were looking upon it as a speculat on, but his view, *ab initio*, was that the company was purely a commercial undertaking, and that it would return a dividend of 100 per cent. upon the capital.

A vote of thanks to the Chairman and directors concluded the proceedings.

[For remainder of Meetings see to-day's Journal.]

FOREIGN MINING AND METALLURGY.

The demand for iron has experienced no check in France, and the recent advance in prices is fully maintained, and even displays a tendency to make further progress. In the Nord and the Ardennes a quotation of 11*l.* 12*s.* per ton for iron is anticipated. There is a considerable foreign demand, especially for the higher class of iron. Pig remains much sought after. Some purchases of iron on English account have been noted recently in Belgium and France, and in presence of the extraordinary activity prevailing in affairs generally it is not suprising that the production of iron in France should scarcely keep pace with the demand, and that the rise should be in consequence solidly established. Iron from coke-made pig is dealt in at 10*l.* 8*s.* to 10*s.* 16*s.* per ton, and iron from charcoal-made pig at 11*l.* 12*s.* to 12*l.* per ton. At Paris affairs are being resumed with activity, and the new resolutions of the Paris Municipal Council with reference to tramways, as well as a circumvallation railway, induce hopes of a further increase of animation in the Parisian iron trade. The house of Wendel, in a recent circular, quotes first-class rolled iron at 12*l.* per ton, with a scale of 16*s.* per ton; first-class hoops and sheets at 14*l.* 8*s.* per ton; and plates at 15*l.* 12*s.* to 17*l.* 4*s.* per ton, according to thickness. Advices from Spain announce a resumption of working operations at the Bilbao ironstone mines. This intelligence has been received with considerable satisfaction in France and Belgium, where the use of iron minerals has been steadily increasing of late.

At Havre, Chilian copper in bars has made 108*l.* per ton; refined ditto in ingots, 106*l.* to 110*l.* per ton; Peruvian minerals (pure standard), 75*l.* to 76*l.*; United States (Baltimore), 80*l.* to 84*l.*; and Lake Superior ditto, 96*l.* to 102*l.* per ton. At Paris rough Chilian copper, delivered at Havre, has realised 110*l.*; ditto in ingots, 112*l.* per ton; English tough cake, 112*l.* per ton; and Corocoro minerals (pure standard) 110*l.* per ton. At Rotterdam, Drontheim has realised 50 fls. to 52 fls.; and Russian crown, 51 fls. The Dutch tin markets have not been quite so firm. Some transactions have taken place in Banca at 94 fls. to 94½ fls., while disposeable Billiton has made 92½ fls. The outlets for the article remain satisfactory, foreign consumers having profited from the advance to make purchases; the deliveries of this month are expected to considerably exceed those of May. At Paris, Banca, delivered at Havre or at Paris, has made 170*l.*; Straits, delivered at Havre or at Paris, 162*l.*; and English, delivered at Havre or Rouen, 162*l.* per ton. At Rotterdam, Banca has made 94 fls. to 94½ fls.; and Billiton, 92½ fls. At Paris, French lead, delivered at Paris, has realised 20*l.* 18*s.*; Spanish ditto, delivered at Havre, 20*l.* 10*s.*; and English, delivered at Havre, 20*l.* 10*s.* per ton. At Rotterdam, Stolberg lead has realised 12⅝ fls.; Spanish, 11⅜ fls.; and German lead of various marks, 12 fls. to 12⅛ fls. At Paris, Silesian zinc, delivered at Havre, has realised 23*l.* 4*s.*; other good marks, delivered at Havre, 23*l.* 4*s.*; ditto, delivered at Paris, 23*l.* 4*s.* per ton.

The imports of iron into Belgium in March are officially returned at 19,000 tons, as compared with 10,000 tons in March, 1871, and 9800 tons in March, 1870. The imports of the first three months of this year show a still more considerable progress, having amounted to 39,000 tons, as compared with 16,000 tons in the corresponding period of 1871. Steel was imported into Belgium in the first three months of this year to the extent of 3000 tons, as compared with 2000 tons in the corresponding period of 1871. The exports of iron from Belgium in March amounted to 26,000 tons, against 22,000 tons in March, 1871; and in the first three months of this year 60,000 tons, against 36,000 tons in the corresponding period of 1871. The exports of Belgian iron made the most progress this year to France; the augmentation occurred, however, wholly in pig. The exports of Belgian iron to the Zollverein were 16,000 tons in the first three months of this year, as compared with 14,000 tons in the corresponding quarter of 1871. The exports of rails have slightly increased; those of merchants' iron have slightly fallen off. The exports of rails and old iron to the United States have increased this year to the extent of about 2000 tons in each case.

The French coal trade remains active, and French colliery proprietors maintain an attitude of reserve, and decline to enter upon long-termed contracts. A good deal of attention is being devoted in France to the improvement of means of communication, and especially to a proposed canal from the Meuse to the Saone, which would unite the Vosges to two great coal districts, Belgium to the north, and the Blanzy and Epinac basins to the south. The Marne is being deepened in order to facilitate its navigation by heavily laden boats. A considerable number of new concessions have been granted for working anthracite coal and lignite in various departments. A proposal has been submitted by the Prefect of the Seine to the Municipal Council for relieving coal intended to be devoted to industrial purposes from octroi duties.

It appears that the exports of coal from Belgium in March are officially returned at 391,193 tons, and for the first quarter of this year at 1,117,429 tons. This latter total presents an increase of 580,219 tons, as compared with the corresponding quarter of 1871, and of 231,245 tons as compared with the corresponding quarter of 1870. The exports of coke from Belgium in March were 64,284 tons, and for the first three months of this year 183,149 tons, showing an increase of 98,522 tons, as compared with the corresponding quarter of 1871, and of 4106 tons as compared with the corresponding quarter of 1870. The imports of coal and coke into Belgium in March were 21,032 tons and 393 tons respectively.

Some adjudications for railway *matériel* which have taken place recently in Germany reflect extraordinarily high prices. Bessemer rails have made 16*l.* 12*s.* per ton; iron rails, 12*l.* 14*s.* 3*d.* to 13*l.* 16*s.* per ton; old rails, 7*l.* 10*s.* 6*d.* per ton; fish-plates, 13*l.* to 14*l.* 8*s.* per ton cramps, 19*l.* 16*s.* per ton, &c.

There is nothing very striking to report with respect to the Belgian iron trade, prices having experienced no sensible variation. Refining pig is held at 4*l.* 16*s.* per ton, and casting pig at 6*l.* per ton; as pig is everywhere scarce, these rates are very likely to be maintained for some time to come. The difference between the price of manufactured products is sufficiently considerable to remove any apprehensions that when a fall sets in it will commence with pig. Merchants' iron (No. 1) stands at 10*l.* per ton, with the usual scale; it is not expected that this rate will be materially exceeded. Notwithstanding the importance of the demand for plates, which has been observed on all sides, No. 2 remains stationary at 12*l.* 16*s.* per ton, with the usual scale between numbers. It is observed that fewer contracts for rails are being concluded in Belgium; either the demand for rails is declining, or the high rates enforced by the iron-works, firms, and companies are frightening away customers. It certainly seems probable that under present circumstances railway companies will confine their orders to those which may be rendered imperative by their most urgent requirements. The average price of the rails used for renewals last year by the Great Central Belgian Railway Company was 6*l.* 14*s.* 5*d.* per ton, 8300 tons having been laid down at a total cost of 55,880*l.*; at present rates the same amount of renewals would have cost 86,320*l.*, and had present prices prevailed all through last year it is probable that the directors would have postponed some of the less urgent renewals. A proof of this is afforded in some observations made by the directors with regard to Bessemer steel rails. Thus, the directors state that while they have every reason to be satisfied with the appreciation made in 1869 and 1870 of Bessemer steel rails on the incline from Lodelinsart to Marcinelle, and on certain curves of the line from Châtelineau to Givet, they have been unable to extend the use of steel rails, in consequence of the extraordinary advance which prices have experienced. The directors of the Great Central Belgian Railway report favourably as to the trials made of iron sleepers upon the system. About ten miles of iron sleepers have now been laid down upon the company's lines, the first application of them dating from about six years since. It is found that girders laid in the cinders or refuse of ironworks oxidise, while when they are laid in other ballast they do not oxidise. They are also liable to break with ballast presenting little resistance, but this is not the case when they are placed in ballast presenting a good resistance, and well packed.

In Austria, as in Germany, Belgium, and France, all metallurgical products are in great demand. Old rails even make as much as 8*l.* 10*s.* to 8*l.* 12*s.* per ton.

The Belgian coal trade continues active, and there is no appearance at present of any check in affairs. Local consumption, coupled with deliveries to a distance, absorbs, upon the whole the production as fast it is effected, so that the stocks on hand are inconsiderable. Prices are also firm. Freights from Charleroi to Paris have fallen to 8*s.* per ton, with every probability of a further fall taking place. In the Mons basin both wages and coal display an upward tendency. Quite a dearth of coal is said to be regarded as probable in France, and prices continue firm in consequence. A Bill has been introduced into the French National Assembly which, *inter alia*, prohibits the employment of girls and women in mines.

FOREIGN MINES.

EMMA.—*Telegram:* Raised first and second-class ore 530 tons this week; 90 tons at railway and depôt; 640 tons raised first-class at mine. Canon road impassable. The mine is in bad working order temporarily from surface water. Slight cave.

SIERRA BUTTES (Gold).—The result of the clean up for the month of May is as follows:—Receipts, $39,718; 3712 tons of ore were crushed during the month. Cost of mining and milling same at $387 per ton=$14,365·44.

BIRDSEYE CREEK.—G. S. Powers, May 15: You ask me to give you the probable monthly and aggregate cost of Neece and West Tunnel. At the present cost of contract the monthly expenses are $460. Should the rock get harder the cost would be greater, and in working from three faces would increase expense threefold, or it is likely the cost of working through a shaft would be more than the present mode of working. The aggregate cost will depend on the character of the rock. My estimate of the whole cost would be between $10,000 and $12,000, and would, probably, take twelve months to complete the tunnel working from three faces. The Browns Hill claim can be worked advantageously through the new tunnel—in fact, it will make a general outlet for a great portion of the company's ground. The water is falling rapidly in company's ditch, and we shall be compelled to shut up one claim soon. At your request, I have secured water from the Yuba Canal Company sufficient to keep the Uncle Sam claim running as long they have any in their ditch, at $15 per inch for 24 hours. We have struck high rock in Uncle Sam claim, which will make it necessary to blast a portion of that ground. I believe the ground on this high rock to be as good as any heretofore washed. I will write you again in a few days further particulars in regard to the mines.

CHONTALES.—Mr. Belt, May 4: Gold returned for April, 267 ozs. from 1185 tons of ore; average produce, 4½ dwts. per ton; value, 74*l.* Cost for the month, 1183*l.*, which includes 144*l.* for construction of new works. Mr. Belt reports that 12 stamp-heads only have been at work the greater part of the month, and 16 the remainder; this was in consequence of the greenness of the wood used as fuel for the engine. Great progress has been made with the erection of the new water-wheel.

BRAGANZA.—Report for April: The deep adit is driven on No. 1 lode 2 fms. 1 ft.; the first division of the month the same was 4 ft. big, hard, and spare to break; at present is split up, disordered, and very poor. We have driven south 3 fms. 1 ft. on No. 3 lode; the same has improved in size and appearance; we are not yet through to the footwall. The samples show a little gold, but not to value; a considerable stream of water is issuing from the bottom, which miners consider a favourable omen. The B cross-cut is driven 3 fms. 2 ft. on No. 3 lode, which is 5 ft. big—a very kindly looking lode. The C cross-cut is driven south 2 fms. through a hard blasting lode, averaging 5 ft. big, and a very kindly looking lode, but poor. The D cross-cut we have risen 2 fms. 2 ft. at a point of a horse where two lodes meet, but up to this there is no change. The E cross-cut we have stoped 3 fms., and driven 3 fms. in a massive quartz lode, which we have at present suspended, and the men placed on other ground.—Jacotinga: We have driven 7 fms. more across, and 4 fms. on the course of one of the lines, without any alteration to notice.

LINARES.—June 5: Pozo Ancho Mine: The lode in the 85, driving west of Crosby's shaft, contains stones of ore in the bottom of the end, worth ½ ton per fathom. The lode in the 75, driving west of Crosby's shaft, is small and poor, and the ground hard. The 75, driving west of San Francisco shaft, has passed through an excellent shoot of ore, worth 1½ ton per fathom. The lode in the 75, driving east of San Francisco shaft, is divided into two parts, on which separate ends are being driven, with a little lead in each, yielding 1 ton of ore per fathom. The ground is hard and the lode unproductive in the 65 driving west of San Francisco shaft. The lode in the 55, driving west of San Francisco shaft, is more open and easy for driving than it was, yielding ¾ ton per fathom. There is no improvement in the 45 driving east of San Francisco shaft.—Winzes: The men are making good progress in No. 181 winze sinking below the 55, worth ½ ton in a fathom. The lode is small and unproductive in No. 182 winze, sinking below the 35. No. 139 winze, sinking below the 35, is situated west of San Francisco shaft, and yields ½ ton of ore per fathom. The tribute department yielded very well in the past month, without undergoing any change of importance. We estimate the raisings for June at 200 tons. The machinery is in good working order, and the surface operations are going on very regularly.—Quinientos Mine: The lode in the 45, driving east of Addis's shaft, is now compact and very regular, yielding ½ ton of ore per fathom. The lode in the 45, driving west of San Carlos shaft, is large and strong, but is not yielding any ore at present. In the 45, driving east of San Carlos shaft, the lode has improved in the bottom of the end, being worth 1 ton per fathom; the upper part is in old works. The lode in the 32, driving east of Judd's shaft, continues very regular, with spots of ore.—Shafts and Winzes: Judd's shaft, sinking below the 32, is in old works, which are likely to continue to the next level, the 45 being under it; it produces ¾ ton of ore per fathom. Henty's shaft, sinking below the 32, is off the lode, and is in hard granite. The lode in Perez' winze, sinking below the 32, is large, and spotted with ore. The lode in Carrascosa's winze, sinking below the 32, shows indications of improvement, and contains a little ore.

ALAMILLOS.—June 5: The lode in the 60, driving west of San Rafael's shaft, contains good stones of lead, worth ¾ ton per fathom. In the 50, driving east of La Magdalena shaft, the lode is small, and the ground hard for driving. The lode in the 75, driving east of La Magdalena shaft, is open, and of a promising appearance, worth ½ ton per fathom. The lode is unproductive in the 85, driving east of Taylor's engine-shaft. In the 85, driving west of Taylor's engine-shaft, the lode is very wide, with good stones of ore. The lode in the 50, driving west of San Yago's shaft, is open, and easy for driving, but does not contain any lead. The 40, driving east of Alejandro's winze, has undergone an unfavourable change in the past week, now yielding 2 tons of ore per fathom. The lode in the 40, driving east of San Victor's shaft, is very wide, with large lumps of ore, worth 1 ton per fathom. The ground is hard for driving, and the lode small in the 50, east of San Victor's shaft. We expect to intersect the lode in the 50, driving south of San Victor's shaft, very shortly. The lode in the 30, driving west of San Victor's cross-cut, is a very promising lode, worth 1 ton of ore per fathom. The lode in the 40, driving west of San Victor's middle lode, has fluctuated very considerably during the past week, now being worth ½ ton per fathom. In the 50, in the 40, driving west of San Victor's south lode, is very changeable. In the 75, driving east of Addis's shaft, the ground is easy for driving, and the lode open, with large lumps of ore, worth ½ ton per fathom. The lode in the 20, east of

Addis's cross-cut, is a very compact and promising one, yielding 3 tons of ore per fathom. The lode in the 40, driving east of Crosby's shaft, has fallen off very much in the last few days, now being worth 1½ ton per fathom. There is a good shoot of ore in advance of the 50, driving east of Crosby's shaft, worth 1 ton per fathom, and we are expecting an improvement daily. The lode in the 50, east of Crosby's cross-cut, is disarranged, and unproductive. The 50, driving west of Crosby's cross-cut, is again improving, and we expect to open a good length of ore ground in this direction, yielding 1 ton of ore per fathom. The lode is very small in the 40, driving west of Morris's shaft, at present.—Shafts and Winzes: The men are getting on well with the sinking of Judd's shaft below the 40. The lode in Air's shaft, sinking below the surface, is split into branches. The lode in Coba's winze, below the 30, contains spots of ore. There is no improvement in Gabriel's winze, below the 30. Garcia's winze, sinking below the 65, is a large and strong lode, worth 1 ton per fathom, but it has declined in value in the past few days. Alejandro's winze, sinking below the 30, is deep enough for the 40; it produces 3 tons of ore per fathom. The full complement of ore was raised in the past month, and the stopes have not undergone any unusual fluctuation. The works at surface are going on very regularly, and the machinery is in good condition. We estimate the returns for June (five weeks) at 300 tons.

FORTUNA.—June 5: The lode in the 110 fm. level, driving west of Henty's shaft, contains good stones of lead, and has a promising appearance, yielding ½ ton per fathom. The lode in the 100 fm. level, driving west of Judd's shaft, is small, compact, and regular, yielding ¾ ton of ore per fathom. In opening the north side of the 80 fm. level, driving east of Henty's cross-cut, the lode looks very promising, and yields good lumps of ore. The lode in the 60 fm. level, driving east of San Pedro's shaft, is strong and productive in the bottom, but the upper part is poor; it yields 1½ ton of ore per fathom. The lode in the 90 fm. level, driving east of Addis's shaft, is very wide, with occasional stones of ore. In the 80 fathom level, driving west of Lowndes's shaft, the lode is large, with spots of ore, but not enough to attach a value to. The lode in the 80 fm. level, driving east of Caro's shaft, is not quite so productive as it has been, yielding 3 tons of ore per fathom.—Shafts and Winzes: The men are getting on well with Lowndes's shaft, sinking below the 80 fm. level; the lode is good in half the length of shaft, worth 1 ton per fathom. Serrano's winze, sinking below the 60 fm. level, is holed to the 80 fathom level, being worth 2 tons per fathom. The lode in Carlos winze, sinking below the 90 fm. level, is small and unproductive.—Los Salidos: The lode in the 110 fathom level, driving west of Buenos Amigos engine-shaft, is small and unproductive at present. The lode in the 100 fm. level, driving west of San Carlos shaft, is very small and compact, yielding ½ ton of ore per fathom. In the 90 fm. level, driving west of San Carlos shaft, there is a very small branch, but it does not contain ore enough to value. The 110 fm. level, driving east of Buenos Amigos shaft, is still in a hard bar of unproductive ground. The lode in the 110 fathom level, east of Morris's engine-shaft, has fallen off in value lately, now being worth ¾ ton per fm. The 100 fm. level, driving east of San Pablos shaft, continues to open a good length of valuable ore ground, worth 2½ tons of ore per fathom. The lode in the 90 fm. level, driving east of San Miguel's shaft, is strong, consisting chiefly of calcareous spar and good stones of ore, yielding of the latter ½ ton per fathom. The lode in the 55 fm. level, driving west of Palgrave's engine-shaft, is a strong, productive, and promising one, yielding 2 tons of ore per fathom. The lode in the 35 fm. level, driving east of Palgrave's engine-shaft, is split into branches, and the men are now driving north, where we expect to find the principal part.—Shafts and Winzes: The men are getting on very well in Morris's engine-shaft, sinking below the 110 fathom level. The lode in Palgrave's engine-shaft, below the 35 fm. level, is divided into several branches, producing 1 ton of ore per fathom. In Lorente's winze, sinking below the 90 fm. level, the lode is open and productive in half the length of the winze; the other part is of little value, producing ¾ ton per fathom. Caloa's winze, sinking below the 25 fm. level, has changed unfavourably during the past month, now being worth 1 ton per fathom. In Moron's winze, below the 100 fm. level, the lode is changeable, and is not now so productive as it was a few days since, yielding 1 ton per fathom. The lode in Gabriel's winze, sinking below the 100 fm. level, is in contact with a strong cross-course at present. The usual quantity of mineral was produced by the tribute department in the past month, and the stopes are now looking moderately well. The machinery throughout the mines, and the surface works generally, are going on very regularly. We estimate the raisings for June (five weeks) at 450 tons.

[For remainder of Foreign Mines see accompanying Supplement and Journal.]

NEW COLLIERY AT NEWSTEAD.—The Staveley Coal and Iron Company (Limited), and the Sheepbridge Coal and Iron Company (Limited), have leased from Colonel Webb the "top hard," or Barnsley, seam of coal under Newstead Abbey estate, near Mansfield, comprising an area of nearly 5000 acres. The seam is about 5 ft. thick, and the lease is said to be for a term of eighty years. A few years ago Mr. Werswick established a colliery on the Annesley estate, adjoining that of Newstead, and the coal has proved equal in quality to the very best hard coal in the Midland counties. It is stated that the depth of the seam from the surface is fully 400 yards, and that the works (which will be commenced forthwith) will be of the most complete character, embracing all modern improvements for raising coal on a large scale. The colliery will be worked for the joint and equal interest of the two companies, and the capital is estimated at 120,000*l*.

THE NEW IRONWORKS AT MOSTYN, NORTH WALES.—In connection with the famous Mostyn collieries, which have gained a repute for their magnitude, a large addition has recently been made thereto by the spirited company, in the shape of an ironworks, which promises to rival the famous Ince Ironworks, at Wigan, the property of Mr. John Lancaster, M.P., who is senior partner at the Mostyn Collieries. Already several furnaces have been constructed, each 21 ft. diameter at the widest part inside, and 61 ft. high. To each furnace five stoves, capable of raising the temperature of blast to 1100°, have been erected, together with six blow-pipes to each, of 3½ in. diameter, the pressure of wind being 2¾ to 3½ lbs. per square inch. A hoist of brickwork, of beautiful construction, in which an ascending and descending cage is scientifically introduced, into which the barrows for filling the furnaces are lifted, has also been built, the whole being worked by a 30-horse power steam-engine. In connection with the works the blast-engine has a steam cylinder of 46½ in. diameter, the blast cylinder being 100 inches in diameter, with a stroke of 8 ft., the steam being supplied by five boilers, each 50 ft. long by 4½ ft. diameter. A novel invention is here introduced; no coal is used for fuel, the steam being got up entirely by gas, brought down from the blast-furnaces in large wrought-iron tubes from the top of each furnace. Connected with the works there is a range of 64 ovens, to supply them with coke, and more are now in course of construction, the coke being made from small coal produced at the colliery. The new works have given employment to many hundreds of men, and the high rate of wages paid has had a very beneficial effect in the neighbourhood. Mostyn has now become a place of commercial importance, equalled only in Wales by Merthyr Tydvil. The new ironworks is under the management of Mr. Joshua Lancaster, who was for many years manager of the works at Wigan.

OXYGEN GAS.—The supply of oxygen gas to the public—in the same way as ordinary gas, to be used for improving street illumination, or to become an instrument in our metallurgical processes—is about to become a fact. M. Tessie du Motay's process for producing oxygen cheaply consists of charging retorts with a mixture of manganate of soda and oxide of copper, from which large quantities of gas are evolved at very small cost, and it is offered to the public at one franc the cubic metre. Applications are being made by the company to the Municipal Council to lay down mains, and to make the necessary arrangements for supplying the public with this gas.—*Athenæum*.

COPPER ORES.

Sampled May 22, and sold at Tabb's Hotel, Redruth, June 6.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
West Wheal Tolgus	90	£8 0 0	Wh. Seton [Pendarves	31	£6 6 0
ditto	32	8 0 0	ditto	20	2 2 0
ditto	80	7 17 0	White and Co.'s Ores	102	0 4 0
ditto	77	7 12 6	ditto	65	1 3 0
ditto	75	7 9 6	South Wheal Crofty	37	4 7 0
ditto	74	4 15 0	ditto	29	3 11 0
ditto	65	8 0 0	ditto	28	2 10 0
ditto	35	2 19 0	ditto	22	5 15 6
Crenver & Abraham	86	4 5 6	ditto	20	3 9 0
ditto	58	6 12 6	ditto	16	4 5 6
ditto	51	4 16 6	ditto	4	14 17 0
ditto	49	4 4 6	Wheal Basset	48	9 1 6
West Wheal Seton	54	7 4 0	ditto	39	4 3 0
ditto	53	3 3 6	ditto	33	3 18 0
ditto	39	11 11 0	New Pembroke	60	5 12 6
ditto	38	10 1 6	ditto	43	12 1 0
ditto	37	3 3 6	Wheal Jewell	30	3 19 6
ditto	14	8 19 6	ditto	35	3 17 6
East Pool	74	4 10 6	ditto	7	9 16 0
ditto	59	4 10 6	North Crofty	65	6 18 6
ditto	28	4 15 6	Tincroft	42	4 11 0
ditto	27	4 10 6	Pennance	21	7 13 0
Wh. Seton [Pendarves	44	6 18 6	Wh. Emily Henrietta	12	3 0 6
ditto	41	7 5 6	South Tolcarne	6	3 11 0
ditto	33	1 5 6			

TOTAL PRODUCE.

West Tolgus	578	£4126 10 0	New Pembroke	93	£ 799 8 0
Crenver & Abra	244	1205 0 0	Wheal Jewell	78	347 6 6
West Seton	235	1633 10 0	North Crofty	65	450 2 6
East Pool	188	857 14 0	Tincroft	42	191 2 0
Wheal Seton, &c.	169	882 7 0	Pennance	21	160 13 0
White & Co.'s Ores	167	95 3 0	Emily Henrietta	12	36 6 0
South Crofty	156	657 15 0	South Tolcarne	6	21 6 0
Wheal Basset	125	745 13 0			
Average standard		£136 8 0	Average produce		6½
Average price per ton			£5 12 0		
Quantity of ore		2179	Quantity of fine copper 133 tons 9 cwts.		
Amount of money			£12,209 16 0		
LAST SALE.—Average standard		£136 11 0	Average produce		5⅞
Standard of corresponding sale last month, £127 19 0—Produce, 6½.					

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Vivian and Sons	334	£1340 0 9
P. Grenfell and Sons	317	2524 0 0
Sims, Willyams, and Co.	394½	2092 12 3
Williams, Foster, and Co.	155	1165 12 6
Mason and Elkington	318	1956 0 6
Copper Miners' Company	283	1092 9 9
Charles Lambert	258	1631 15 9
The Bede Metal Company	119½	407 4 6
Total	2179	£12,209 16 0

NO SALE on Thursday last, June 13th.

Copper ores for sale at the Royal Hotel, Truro, on Thursday week—Mines and parcels.—Devon Great Consols 1402—South Caradon 419—Marke Valley 378—Glasgow Caradon 322—Gawton 289—Phœnix 270—Hingston Down 213—Bedford United 73—Florence and Tonkin 50—Kelly Bray 44—Elliot's Ore 19—Belstone 13.—Total, 4068 tons.

Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—*June 15, 1872.*

SUPPLEMENT.

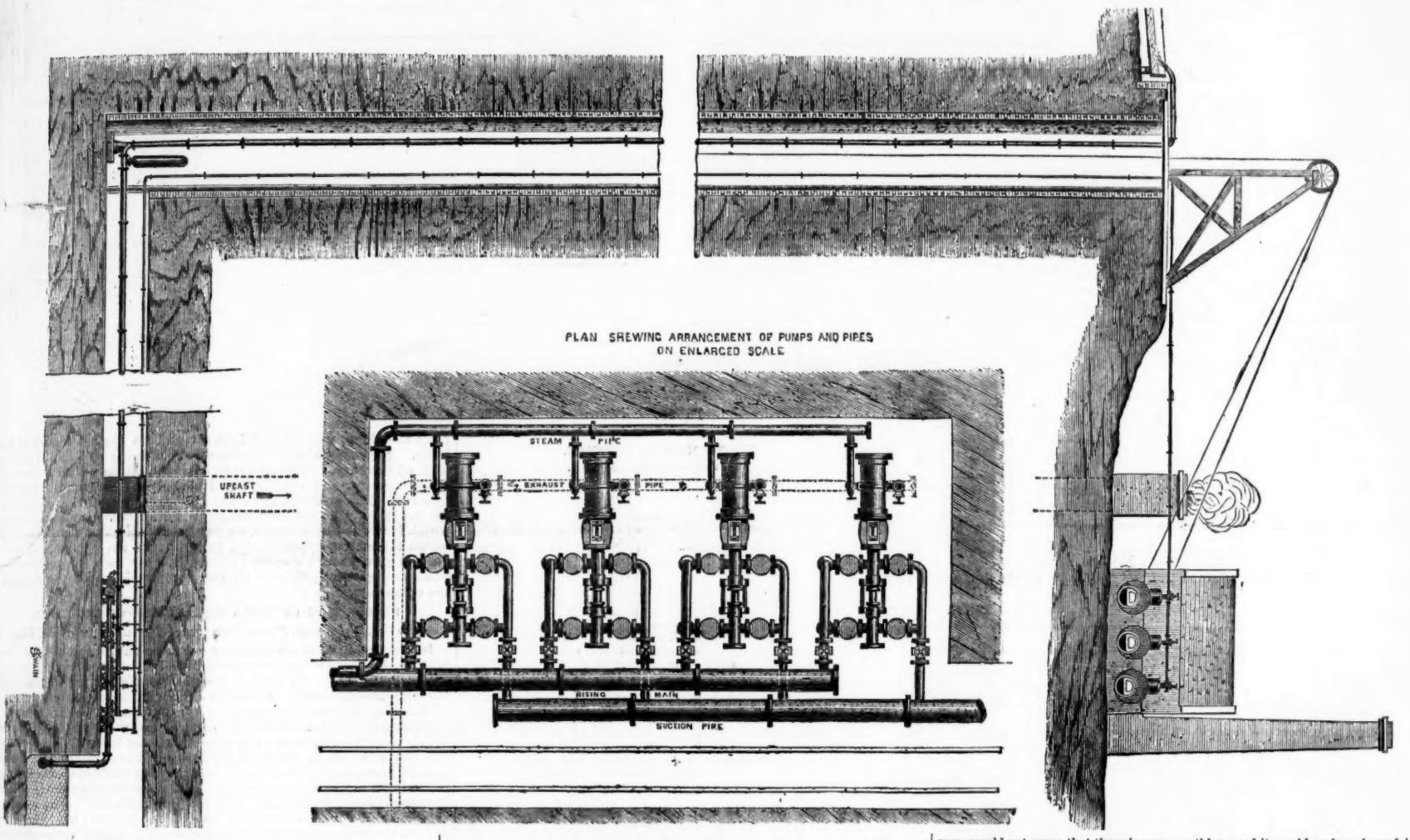
The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1921.—Vol. XLII.] LONDON, SATURDAY, JUNE 15, 1872. {PRICE.....FIVEPENCE. PER ANNUM, BY POST, £1 4s.

THE DRAINAGE OF MINES—HAYWARD TYLER AND CO.'S (OKES') PATENT.



THE DRAINAGE OF MINES—HAYWARD TYLER AND CO.'S (OKES') PATENT.

We have the pleasure this week of bringing before the notice of our readers a patent, which appears likely to be of immense importance to the mining community, and one which bids fair to create a revolution in the method of freeing pits from water. It entirely overcomes the danger hitherto experienced in placing pumping machinery underground, as well as obviating the great evil attendant upon all pumping operations when performed by one large engine, whether placed on the surface or below—viz., the heavy pulsation of the water in the rising column. We have known instances of the lower pipes of the rising main failing, when the calculated resistance was considerably more than three times the pressure due to the head of water, simply by the accumulated force of the column put in motion and suddenly arrested—which action must necessarily take place during the reversal of the stroke when the lift is performed by one large engine. The same concussion takes place in a lesser degree when a pair of coupled engines are employed, for even then there must be a moment when the column will "drop."

Another effect of this sudden stoppage of the column, which is a source of constant annoyance and expense to mine owners, is the great wear and tear of the pump valves—whatever kind may be employed. We believe with the system now in use some mining engineers think themselves tolerably fortunate if the pump valves require renewal but once in three weeks. As a proof that this rapid deterioration of pump valves is not a necessary result of the high pressure, we may remind our readers that the valves of hydraulic press pumps, working at 2 tons to the square inch, last many years without renewal. The difference may be ascribed to two causes—the absence of concussion and the small size of the valves. It is evident, therefore that if we can bring the valves of our mine pumps to work under more nearly the same conditions as those of hydraulic pumps—the life of the valves will be in the same degree prolonged.

Plurality of pumps, each independent in all respects, as described in the patent alluded to, can alone obviate the difficulties above described. Every mining engineer will, we are sure, endorse this opinion. The chief advantages claimed in the patent are three:—

1.—That which we have mentioned, obviating the danger of fracture of pipes and destruction of valves by the pulsation.

2.—Rendering it safe to place the pumping machinery below ground. In the case of a number of pumps being employed, and one being under repair for a time, the remainder can master the water during the repairs; whereas, in the case of a single engine being used, should any accident occur to it, rendering it useless for a time sufficiently long for the water in the mine to rise above it, considerable expense would be incurred by the substitution of temporary machinery.

3.—Saving of enormous outlay at first. Sinking shafts is at all times a hazardous operation, there being always an uncertainty as to the quantity of water which will have to be contended with. The system advocated by the patentees proportions the pumping power to the quantity of water, the power being readily increased as the headings advance, and the new feeders are tapped.

Mining engineers are becoming fully alive to the fact that steam can be safely introduced into the workings, and carried 1000 yards, if necessary, in well-protected pipes with but little diminution of pressure, and that this method of conveying power is far cheaper than the old-fashioned plan of spear-rods, requiring constant attention and renewals, besides absorbing the greater part of the power in friction. This is especially the case when the shaft is slanting, and the weight of the spear-rods has to be carried on rollers, &c. The exhaust steam, too, if carried to the upcast shaft improves the ventilation. The system patented by Messrs. Hayward Tyler and Co. (of Whitecross-street, London) seems to be a move in the right direction, and will, we think, prove a boon to mine owners. The patentees do not confine themselves to any particular class of pumps; but their experience of the great esteem in which their "Universal" Pump is held by those who are using it for mine-pumping giving them great confidence in it, they are naturally inclined to give this machine preference. The form of pump shown in the accompanying wood-cut is, perhaps, new to some of our readers; we would, therefore, explain that it is an arrangement combining much of the compactness of the double-acting piston pump with the advantages as regards the packing from the outside, which can only be obtained by the plunger arrangement. The motive, or steam cylinder, is precisely the same as in their ordinary "Universal" Pumps.

ANGLO-AUSTRALIAN COMPANIES.

One advantage which residents in England will derive from the establishment of direct telegraphic communication with Australia will be that they will be able at once to procure trustworthy information relative to the various Australian speculations in which they are invited to invest their loose cash. There is plenty of room in Victoria for the profitable employment of a large amount of capital, and there is evidence that British capitalists are not unwilling to assist in the development of our resources, when by so doing they can at the same time benefit themselves and secure a very handsome return for their outlay. During the last few years, however, some very glaring attempts have been made to take advantage of the credulity of the British public, some of which the *Argus* has successfully exposed. We have now before us a prospectus which was published in the London *Daily Telegraph* of Jan. 13 last, in which nearly all the principal statements are gross exaggerations. The document to which we allude is the prospectus of a company to be called the Australian and Oriental Coal Company, formed for the purpose of buying up the Minmi and New Lambton Collieries, at Newcastle, New South Wales. The nominal capital of the company is 300,000*l.*, and the public are invited to subscribe for 22,000 shares, at 10*l.* each. The price of the two collieries and plant is fixed at 130,000*l.*, the vendors generously offering to take 50,000*l.* cash, and the balance in shares. We think there are a few gentlemen in Melbourne who some time since would have been glad to get rid of their share in the Minmi Coal Mine for a sum ridiculously small as compared withthat now asked for it, and who ultimately lost every penny they had invested in it, and a large amount besides. This fact, however, would not prove that the mine was worthless, and it would perhaps be unfair to contend that coal does not exist in payable quantities on the property in question, or that it cannot be profitably worked.

The objection we make is to the flagrant misrepresentations contained in the prospectus, by means of which it is sought to float the company and dispose of the shares. One of the paragraphs in this remarkable document runs as follows:—"In order to insure constant employment to the collieries, it is proposed to purchase or build four screw colliers, capable of carrying 1500 tons of coal each, and to work them in connection with the collieries in the intercolonial trade. That trade now amounts to half a million tons per annum, of which these four colliers will supply at least 200,000 tons. This work is now most imperfectly done by small sailing craft of from 50 to 100 tons, and so uncertain is the supply at Melbourne during the winter that the price of coal there occasionally goes up from the ordinary wholesale price of 21s. to 50s. and upwards a ton, while the screw colliers could land it at 21s. a ton, at a large profit to the company. The directors can speak with much confidence of the great advantages to be derived from the employment of the proposed steam-colliers. Indeed, such vessels constitute a necessary part of the undertaking." The man who could crowd more misrepresentations than are contained in the above into a single paragraph would be entitled to be regarded as a professor of equivocation. In the first place, it is utterly untrue that Melbourne is principally supplied with coal by sailing craft of the description mentioned. The steamers Omeo, Blackbird, Macedon, You Yangs, and Dandenong, are almost regularly in the trade, whilst the sailing vessels are of far larger tonnage than is stated. For years past the average wholesale price of coal in Melbourne has only ranged from 19s. to 21s. per ton. Once during very exceptional weather, when sailing vessels and steamers were alike unable to make the port, coal went up to something like 40s. per ton, but this only lasted for a week or so, and such a circumstance may perhaps never occur again. Then it is absurd to talk of employing steamers of 1500 tons in the service. They could not come up to the Yarra wharves, and would either have to discharge at the Sanbridge pier, or send their cargoes up by lighters. Either method would add considerably to the original cost of the coal, and the employment of such vessels for such a purpose would be sufficient to ruin any coal company in Australia.—*Melbourne Argus*, April 10.

Improvements in Steam-Engines.—A valued communication is, according to the invention of Mr. James Weir, of Glasgow, introduced between the valve casing and the condenser, or between the valve casing of one low-pressure cylinder and that of the next lower cylinder, where there are more than two. The correcting valve is acted upon by a spring, or weight, or by a disc, diaphragm, or piston, exposed to the atmosphere externally, and suitably proportioned relatively to the valve according to the arrangement of the engine, and on the back pressure increasing above its proper limit, it opens the valve and allows the surplus pressure to pass. By a second modification, excessive back pressure is neutralised by placing common check valves in passages between the cylinder ends and the exhaust passage and opening towards the cylinder. When the engines are fitted with surface condensers, the difficulty of starting arising from pressure in the condenser is by this invention overcome or reduced by the temporary use of a three-way eductor. This eductor is a conical passage connected to the condenser steam space by a pipe, and having within it two concentric conical nozzles, to the central one of which a jet of steam is led direct from the boiler, whilst the intermediate nozzle communicates by a pipe with the outlet of the circulating water from the condenser. Where this eductor cannot be conveniently applied, a similar result may be obtained by connecting pipes from the steam and water spaces of the condenser to an auxiliary engine or donkey-pump, the conjoint pumping of the water with the air greatly facilitating the extraction of the latter.

Rotary or Centrifugal Pumps.—The improvements proposed by Messrs. Heald, Morris, and Sisco, of Baldwinsville, Onondaga, U.S., consists firstly in constructing rotary or centrifugal pumps with a piston-wheel revolving in a scroll cylinder or casing of ordinary construction, such piston-wheel having hollow curved arms extending from a central chamber (into which the water or other fluid to be raised enters) to a circular rim forming the periphery of the piston-wheel; secondly, in combining with such centrifugal pumps an auxiliary force or suction pump for priming or filling the pump when this is required for use as a suction pump.

THE QUICKSILVER MINES OF IDRIA—No. III—MERCURY DISTILLING WORKS.

I.—QUART FURNACES.—Fig. 1*a*,

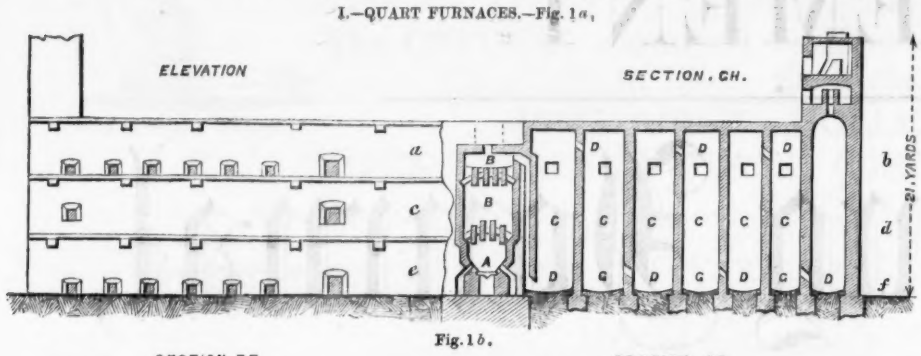
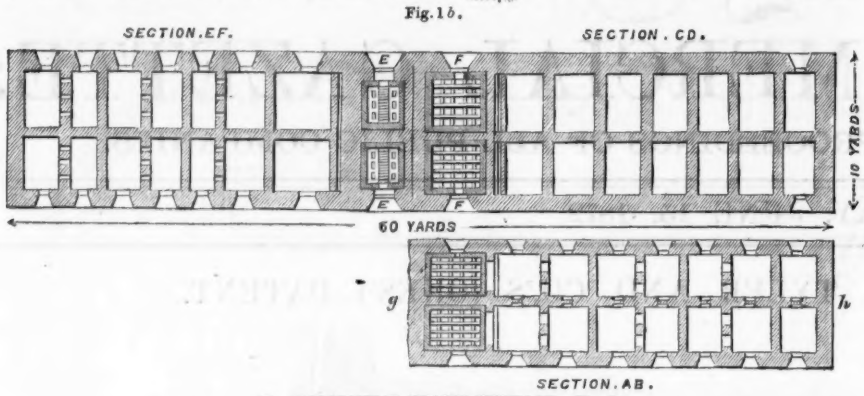
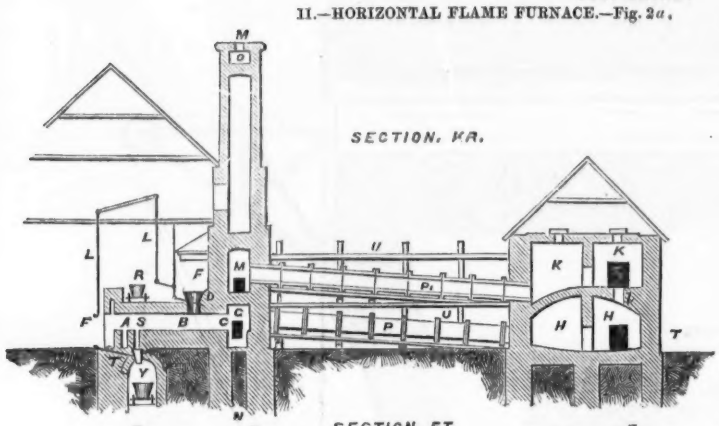


Fig. 1*b*.



II.—HORIZONTAL FLAME FURNACE.—Fig. 2*a*,



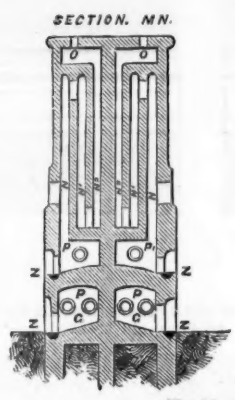


Fig. 2*b*.

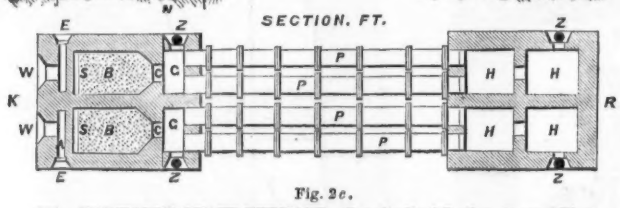
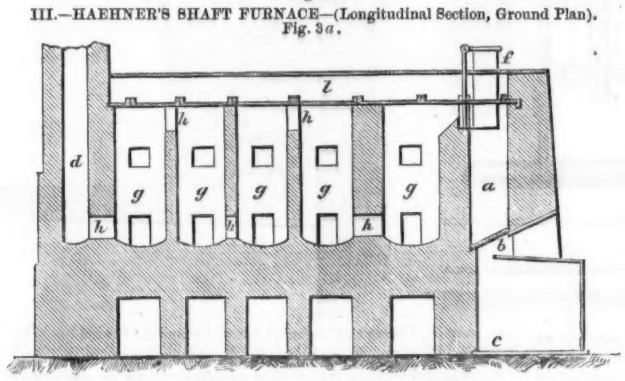


Fig. 2*c*.

III.—HAEHNER'S SHAFT FURNACE—(Longitudinal Section, Ground Plan). Fig. 3*a*.



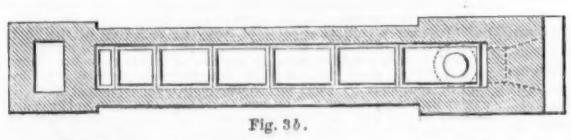


Fig. 3*b*.

IV.—NEW SHAFT FURNACE—(Longitudinal Section)—Fig. 4*a*.

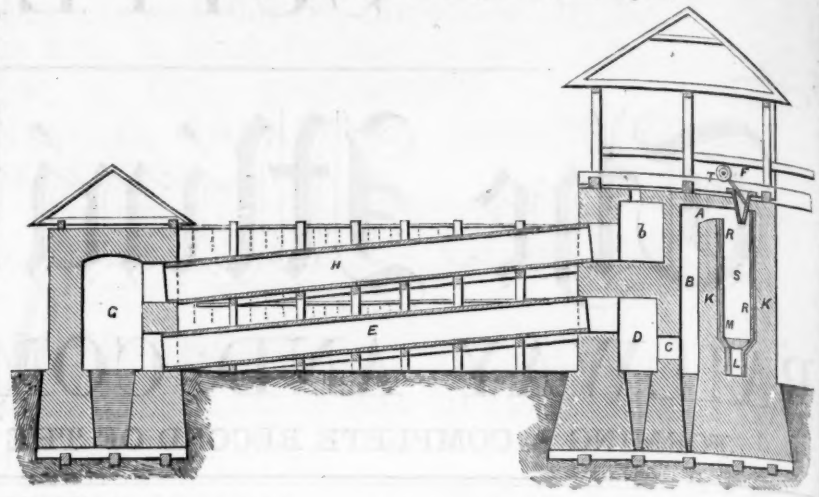
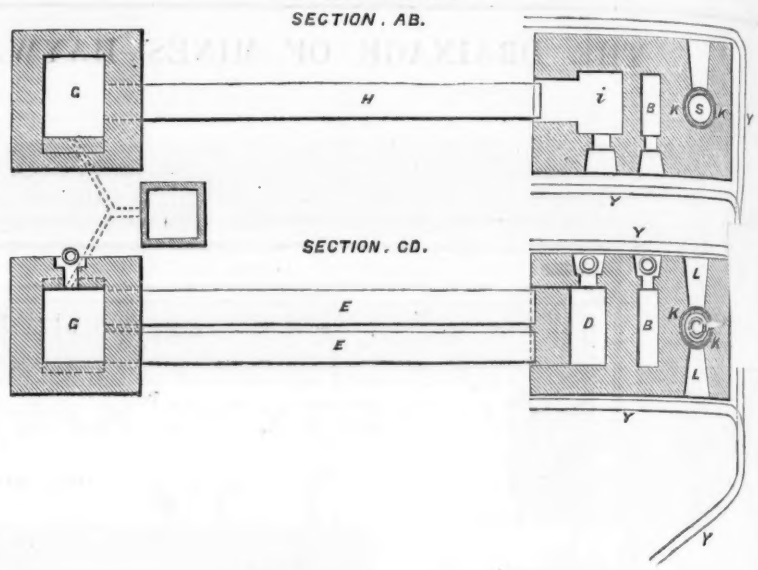
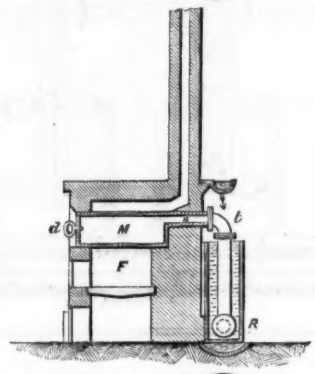
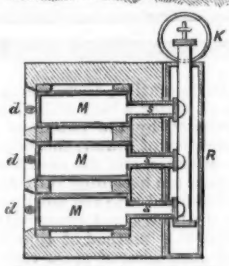


Fig. 4*b*. and Fig. 4*c*.



V.—MUFFLE FURNACE.
Vertical Section—Fig. 5*a*.





Horizontal Section—Fig. 5*b*.

Original Correspondence.

THE QUICKSILVER MINES OF IDRIA—No. III.

THE MERCURY DISTILLING WORKS OF IDRIA.

These works are situated about three-fifths of an English mile north-east of the town, on both sides of the Idriza River, which supplies the works with the necessary power.

A. *On the left side of the river is placed*—1. The Quart-furnace, a Leopold furnace, and a muffle furnace, for rich quicksilver ores; 2. The pottery (Lansheria), where earthen dishes are made, necessary for the distillation of mercury and for vermilion making; 3. The assay office, with two assaying furnaces and a trial muffle furnace for the distillation of rich ore, a room in which the samples of ore are weighed, and the assayer's office.

B. *On the right side of the Idriza River lies*—1. The vermilion manufactory, with a storehouse; 2. A workmen's room; 3. The offices; 4. Five horizontal double-flame furnaces; 5. Stores for the mercury obtained from the furnaces; 6. A horizontal turbine-wheel, driving a centrifugal pump, which raises the water necessary for condensation from the bed of the Idriza River to the top of the horizontal flame furnaces; 7. A water-pressure drawing engine, for raising the burned ore of the horizontal flame furnaces to the floor of the distilling works,—all these contrivances are enclosed in one complete building; 8. North of the building are four new vertical distilling furnaces recently erected; 9. A big storehouse, having 24 divisions, in which about 14,000 tons of ore, brought on rails from the reduction works, can be deposited; 10. For the distillation of mercury from rich ores, three muffle furnaces have been erected in a separate building; 11. A very complete bathing house, with three basins, as frequent bathing is of great importance to the health of the workmen; 12. A new office for the officers employed in the works, and a new assayer's office, are in course of erection.

The ores brought from the reduction works to the distilling works are:—

I. *Rich ores: a*, very rich ore, 30 to 70 per cent.; *b*, rich coarse ore, 15 to 30 per cent.; *c*, rich fine ore, 10 to 20 per cent.; *d*, middle rich ore, 5 to 10 per cent.

II. *Poor ores: a*, very coarse ore (Wænde); *b*, coarse ore (Slufen); *c*, middle size ore (Graupen); and *d*, fine ore (Gries); the average contents of mercury being 1 to 1½ per cent.

On the size and richness of ores to be distilled depends the construction of the furnace, while the process of distillation in the whole remains the same. The quicksilver ores chiefly contain cinnabar ($Hg S_2$), a bisulphuret of mercury mixed with more or less earthy and bituminous matter. To obtain the metallic mercury the ore must be heated, by the access of air, to such a high temperature as is required to decompose the cinnabar, so that the sulphur of the bisulphuret, with oxygen of the atmosphere, escapes in form of sulphurous acid ($S O_2$), while the mercury steams off. This is performed by a temperature of little over 656° Fahr., when the mercury boils and vaporises.

The distillation of mercury, in whatever description of furnace, consists in the process to evaporate the mercury out of the ore, and then to condense the mercury vapours. The process can be performed—*a*. By burning the ore on the bed of a horizontal flame furnace, or in a vertical or shaft furnace, into which the ore mixed with the fuel is regularly charged, or in a vertical flame furnace, where the ore is put on a grate and is heated from below the grate. The mercury vapours mixed with the products of combustion of the fuel are together conveyed into condensers either of stone masonry or iron construction, which are cooled either by air or water. *b*. In furnaces in which the ore is heated in a separate closed room or vessel, so that the mercury vapours produced, free of the products of the combustion of the fuel, are conveyed in tubes in which they are condensed.

From the first sort of furnaces (*a*) the mercury is obtained not quite clean, but it forms a black mass termed "stupp." The stupp is a mixture of metallic mercury, 50 to 60 per cent., cinnabar ($Hg S_2$), with particles of coaldust and ashes, Idria tin, with a little sulphuret of iron and selen. The stupp being wet, is dried, and then rubbed with wooden crutches on inclined tables, 9 ft. long and 6 ft. broad, by which process a great part of the mercury is separated from the stupp, which flows into a vessel on the lower edge of the table. The stupp after it has been rubbed contains still 18 to 20 per cent. of mercury. This poor stupp is brought on earthen dishes of 12 in. diameter and 4 in. high and placed in the furnace for re-distillation. The products from the re-distillation of the poor stupp are again metallic mercury and stupp, but of much smaller quantity which is worked over again, as before stated. The furnaces in which the mercury vapours are parted from the products of distillation give a much cleaner product, because only the mercury vapours and gaseous products of the decomposition of the ore and the condenser.

DESCRIPTION OF THE CONSTRUCTION OF FURNACES.

I.—*The Vertical Flame Furnace or Quart-Furnace.* (Fig. 1 *a*, 1 *b*, 1 *c*.)

In one casing of stone masonry are four furnaces built together, whence the name "Quart-furnaces." In these furnaces could be distilled ores of any size, though they are solely for the treatment of the coarser ores in use. From the drawing it is to be seen that each of the four furnaces has the same construction. The furnace is of a rectangular section, the fireplace consists of the iron bars (A), over which two arched grates of brickwork (B, B) termed "crosses" are one above the other. Each of the furnaces has a series of six chambers (C) for condensation, with the flues (D), while the access of the air to the fire-place is permitted through separate channels (E). The furnace is charged through four openings (F), two being on each side of the furnace, each above one of the crosses (B). The ore is put on the masoned crosses (B) together, the largest pieces are laid in the corners of the furnace from draught-holes, while all the empty space over the crosses is filled up with ore of a smaller size.

When the furnace is completely charged, all charging holes and openings are closed up with bricks and loam, only the apertures to the fire-place being left open. After this a very strong fire is kept in the fire-place, from 12 to 18 hours), until the workmen, from the heat, through the sight-holes, and by the colour of the smoke from the chimney, know that they have to leave off heating. The furnace is now left to cool slowly, after which the demercurised ore (attle) is discharged through the charging holes, and the furnace again charged with fresh ore. The condensing chambers (C) are left closed, and only the basins forming the bottom of the chambers are examined for the quantity of mercury. The charging, heating, cooling, and again discharging of the furnace takes about a week's time, and only after several charges is the campaign finished. The furnace with the condensing chambers is left to cool completely; the refuse is taken from the furnace, and the chambers cleanly swept; the metallic mercury collected in the basins (G) is drawn off, and the stupp taken out and worked over again. The cooling of the condenser is very imperfect in these furnaces, being done only by the air, the winter is, therefore, the best season for working them.

II.—*The Horizontal Flame Furnace.* (Fig. 2 *a*, 2 *b*, 2 *c*.)

There are five double furnaces of this kind put up side by side. These furnaces are for the distillation of middle and fine size (Graupen and Griese) poor ores, containing about 1 to 1½ per cent. of mercury. The ore is brought from the storehouse in wagons (R) of 16 cwts. capacity, on rails, to the top of the furnace. One charge consists of three wagons, equal to 2½ tons of ore. The ore is charged on the bed (B) of the furnace by degrees through the funnel (F) in the arched roof, which charging hole (F) is closed and re-opened by a sliding door (D), in connection with a compound lever apparatus (L). From the whole charge of 2½ tons, 16 cwts only are put on the hearth at a time, and are spread equally over the bed with a rake, which is brought in the furnace through the working aperture (W). After the working aperture (W) is closed and plastered up with loam, the heating of the furnace is commenced. On the fire-place (A) wood is put through the openings (E) on the side of the furnace. When the surface of the ore is red-hot, the door (W) is opened, and the ore turned with shovels, so as to get the heated ore on the bottom and the dark ore on the top of the bed (B). This operation must be performed very quickly—1, not to lose much heat; and 2, that the workmen may not be exposed to the noxious vapours. It generally takes about five minutes. The door (W) is again closed and plastered, and heat applied until the whole of the ore is red-hot. The fire is then lessened, the door (W) re-opened, and the ore, being one-third of the whole charge of 2½ tons, drawn from the hearth (B) to the slit (S), where the last particles of the mercury evaporate. The second portion of the charge is brought through the charging hole (F)

the hearth (B), and spread over the bed, between the discharging
it (S) and the charging hole (F), after which the third portion is
harged on the bed, of which about 8 cwts. is spread out over the
earth, the remaining 8 cwts. being left in form of a conical heap,
aused by the fall of the ore through the funnel (F) on the bed (B).
The working aperture (W) is now closed, and the second and third
portions of the whole charge worked as before.

The refuse left in the discharging slit (S) falls, by opening the
liding door (T), through the shoot (S) into the wagon (V), and is
rought on rails to the water-pressure drawing engine, which raises
he wagon to the floor of the works, where it is brought to the bar-
ow (Berghalde).

The distillation of mercury from the charge of 2½ tons is finished
about three hours, so that in each furnace eight charges, or 20 tons,
f ore can be distilled. The products of the distillation being—mer-
ury vapours, steam, sulphurous acid, the gaseous products of com-
ustion of the fuel and of the bituminous schists, small particles of
re, charcoal, and ashes enter through the flue (C) the chamber (G),
ass through two cast-iron tubes (P) of 3 ft. diameter and 42 ft. long,
hich are cooled by a continuous shower of water falling from the
under (U) on the tubes, to the chambers (H), and through flues (I)
o the upper chamber (K), then through the tube (P_1) to the cham-
er (M), and through the flues of the chimney (N_1 N N_2) by (O) into
he atmospheric air. The condensation in this kind of condenser is
o perfect, that by the stack (O) only the gaseous products of com-
ustion of the fuel and bitumen, with the sulphurous acid formed
y the burning of the ore, escape.

In these furnaces the work goes on continuously for six months,
fter which time the tubes are swept and cleaned, but the flues and
ondensing chambers are cleaned only once a-year, after two cam-
aigns are passed. The cleaning of the chambers and tubes is the
ost laborious and noxious work of the whole process. The furnace
s left to cool, after which all apertures of the condenser, chimney,
nd furnace are opened. A core of six men, dressed in strong linen
loth, with caps to shield the head, enter each double furnace, and
ommence to sweep and clean the chimney, condensing chambers,
nd tubes, and at last the furnace, with brooms and rakes, but
ometimes they have even to use a pick, or a gad and hammer, where
he bituminous stupp is baked together. By this cleansing of the
ole of the furnaces the globules of mercury unite together in big
ops, and are collected in cast-iron basins (Z) set in the walls of
he furnace and chambers. The clean mercury collected in the
asins (Z) is taken to the storehouse, and the stupp obtained is re-
orked, as before described.

III.—*The Shaft Furnace of Mr. Haehner.* (Fig. 3 *a*, 3 *b*.)

Mr. Haehner, a German, has proposed a shaft furnace for the distil-
ation of mercuriferous ores, similar to the vertical calcining furnaces.
he furnace is a vertical cylinder (*a*) of 18 ft. high and 3 ft. 8 in.
iameter, made of bricks with a casing of masonry. The fire-place
onsists of movable iron bars (*b*), so as to make it possible to draw
he calcined stuff into wagons when the bars (*b*) are removed. The
res and charcoal are successively charged through the funnel (*f*),
hich can be opened and closed. The condenser has five chambers (*g*)
hich communicate together with the flues (*h*), so that the gases, &c.,
have to pass them before they enter the chimney (*d*). The chambers are covered at the top with cast-iron plates (*l*), which are cooled by a continuous stream of water flowing over them. The chambers have a height of 18 ft., the bottom is made in a basin-like shape of stamped loam, so as to collect the condensed mercury, from whence it flows into a large receptacle. The products from the furnace are the same as by the before-described furnaces—clean mercury and stupp. The furnace has been at work since 1851, a long period, but the results were not very satisfactory, owing to the imperfect construction of the condenser, and to the material (brick and stone masonry) used in the erection of the furnace. After several trials on a small scale it was concluded to erect new shaft furnaces of a different construction, of which two were erected in the year 1869, and two in the following year.

IV.—*The new Shaft Furnace.* (Fig. 4 *a*, 4 *b*, 4 *c*.)

The construction of this furnace is a combination of the Haehner's shaft furnace and the condenser of the horizontal flame furnace. The new shaft furnace has a 24-ft. round shaft (S), 4 ft. diameter, into which the ore is charged through the funnel (F). The gases escaping from the fuel and ore enter the flue (A), the chamber (B), the flue (C), the chamber (D), then through the two inclined tubes (E and E), the chamber (G), and pass through the tube (H) to the chamber (I), from whence they are drawn by a ventilating fan, or by any other exhauster. The ringwall is made of fire-bricks, the casing (K) of very strong stone masonry. The flues and chambers are all well cemented. The condensing tubes (E and H) for two of the furnaces are of cast-iron, while the other two furnaces have wooden tubes with iron hoops, the latter being cheaper and equally good condensers. To set the furnace working, a small fire is kept to anneal it, then the shaft is filled, first with pieces of wood, then charcoal, and lastly the ore mixed with charcoal. The wood is lighted through the apertures (L) beneath the iron grates (M). When the fire penetrates through the ore, so that it is seen through a sight-hole on the top of the furnace, new charges of coal and ore are inserted alternately through the funnel (F) on the top of the furnace, which can be closed and opened with the sliding door (T). In the same proportion in which fresh ore is charged, the burned ore is drawn through the apertures (L) into wagons and taken on the rails (V) to the burrows. The results respecting the loss of mercury in this description of furnace were not satisfactory. The reason of this may be, the stone masonry of the casing being two yards in thickness, it is impossible to make it impenetrable to the mercury vapours of such high volatility. The advantages of these furnaces are—the workmen are less exposed to the mercury fumes, and the work is not so hard in comparison with that by the horizontal flame furnaces.

V.—*The Muffle Furnace.* (Fig. 5 *a*, 5 *b*.)

In the mercury distilling process it is desirable to avoid as much as possible the mercury being mixed up with the other products resulting from the combustion of wood and the distilling of the bitumen from the schists, so as to obtain the greatest possible quantity of quite clean mercury at one operation. Several attempts were made in this respect with muffle furnaces, which gave good results as to the produce of mercury, but they were given up, because the working of them was very unhealthy, no workman being able to stand it for any length of time. Lately, the trials upon the system of muffle furnaces were again taken up. The Figs. 5 *a* and 5 *b* represent a muffle furnace with three muffles (M), built side by side in one casing. The muffles are heated from beneath, (F) being the fire-place, with movable bars. The muffles (M) are of cast-iron, with an aperture (*d*) for charging and discharging the ore, which is closed up with a well-fitting door. The other end of the muffles communicates through the short pipes (*s*) and the vertical pipes (*t*) with the condensing pipe (R), which is cooled by water, so that the condensed mercury flows in the receptacle (K), which is filled with water, and into which the end of the condensing pipe (R) reaches. The fine-crushed rich ore, and the stupp obtained from the other furnaces, is mixed with lime-water and made into small bricks (Stoeckel), which are placed, after being dried, on a sheet-iron pan, and so charged in the muffle furnace to be distilled. In the newer construction, the condensing pipe is in connection with a ventilating fan. When the charging aperture is opened for taking the burned ore out and to give the new charge in, the fan is set to work to suck the mercury vapours in, so as to prevent their return, which is really a great improvement. The trials with these muffle furnaces and others of cast-iron constructed furnaces are continued, the merits of which have still to be ascertained. In the whole, the loss of mercury in the distilling process amounts to about 40 per cent. of the contents, according to the assays of the ores before and after the distillation.

For the assaying of the mercury ores, the refuse, &c., two furnaces are built for small retorts. To assay the ores, 4 ozs. of the commercial weight (equal to 100 lbs.) of the ore are mixed with more or less quicklime, according to the richness of the ore to be assayed. This mixture is put in the conical retort, to the neck of which earthen recipients are placed, and well plastered up with loam. The retorts are put in the furnace, and heat applied until all the mercury is distilled over in the recipient, which is cooled by water. After the retort is cooled the luting is taken off, and the mercury in the recipient drawn off and weighed, which weight gives the contents of mercury in 100 parts of the ore.

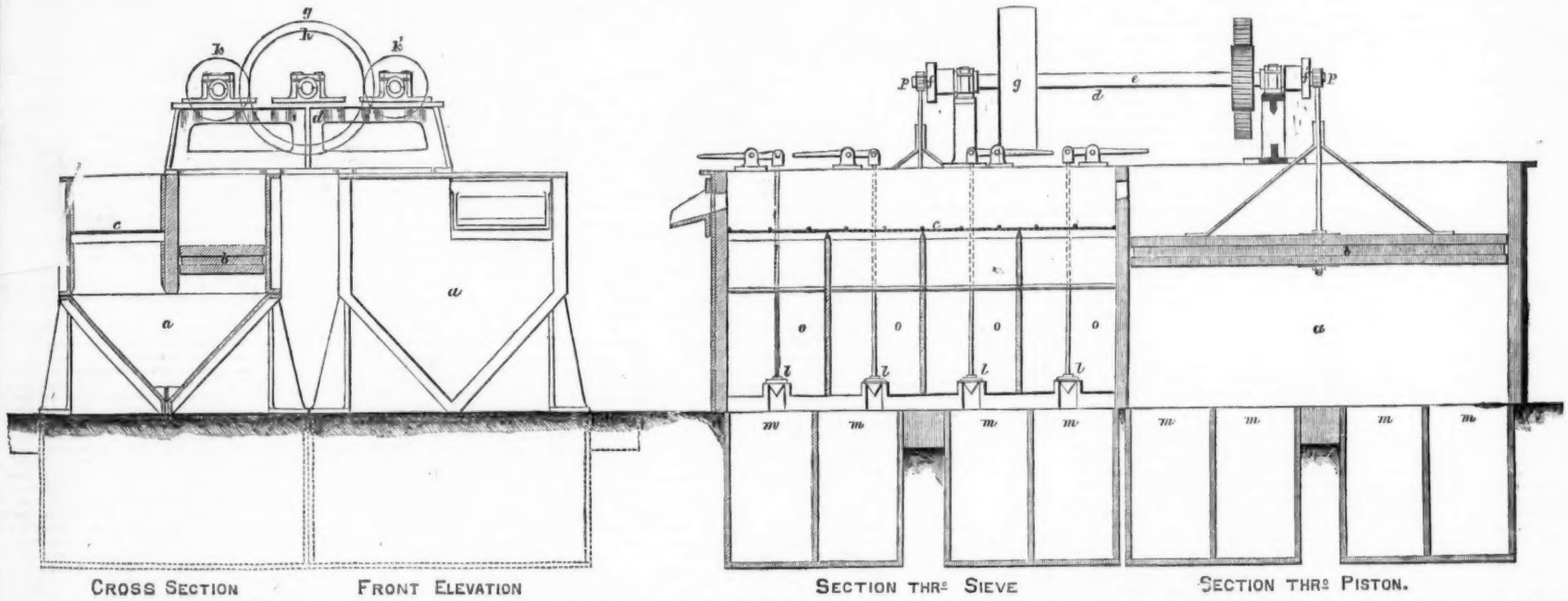
Having described the whole process of the distillation of mercury from the ores, I have finally to add the storing and packing for transport. The mercury obtained from the furnaces is poured into sheet-iron bottles of 1 cwt. capacity (Austrian commercial weight), and brought to the storehouse, where it is poured into large cast-iron vessels. In former times the mercury was packed in iron bottles, with a screw cork, similar to that coming to the market from the Almaden Mines, in Spain, and sold according to the Spanish weight. Latterly, this way of packing is dispensed with, and instead, each parcel of 50 lbs. (commercial weight) of mercury is put into two skins of white leather, the rims of which are tightly bound together with strong twine. Two such parcels are packed in a small wooden barrel, which is safely fastened up and officially sealed.

The following shows the steady increase of the annual produce of mercury from the Quicksilver Mines of Idria :—

In the year 1865	302,300 lbs.	In the year 1869	565,400 lbs.
,, 1866	328,100 ,,	,, 1870	661,800 ,,
,, 1867	463,900 ,,	,, 1871	1,000,000 ,,
,, 1868	512,100 ,,	(Austrian commercial weight.)	

Przibram, Lillshaft. A. PLAMINEK.

ORE DRESSING MACHINERY.



ORE-DRESSING MACHINERY—No. XIX.

The FINE SAND JIGGER shown in Fig. 1 is designed for the treatment of sand grains from one quarter to one millimetre in diameter. The hutch is divided for two pistons and a pair of sieves. Compartments are formed underneath the sieves for receiving ore and orey stuff. The overhead gear consists of a shaft, driving-wheels, and discs slotted for piston-rod pins. The pistons are hung so as to balance each other, and when two jiggers are employed the pistons of each jigger are worked back to back. The discharging launders are not shown, but these deliver into a main launder set between the two hutches. Fig. 1 is a section through the first piston and second sieve; Fig. 2, a front elevation, cross-section of hutch, and elevation of driving-gear: (*a*) hutch, 10 ft. long and 2½ ft. wide; (*b*) piston, 5 ft. long and 14 in. wide; (*c*) sieve of iron wire, supported on a wrought-iron grid, and held down by wrought-iron cross-bars; (*d*) cast-iron head-gear frame; (*e*) jigger shaft; (*f*) discs; (*g*) driving rigger; (*h*) driving wheel; (*k*) wheels on jigger shafts; (*l*) discharging valves 4 in. diameter; (*m*) collecting boxes 12 in. wide; (*o*) receptacles 15 in. wide. The piston stroke is lengthened or shortened by shifting and fixing the pins in the slotted discs, and, if necessary, slides are fitted to the discharging ways from the sieves for the purpose of modifying the thickness of the separating beds. The form of jigger shown in the sketch is probably one of the cheapest which can be devised: two pistons are made to do the work of four employed in the ordinary jigger, whilst the driving-gear for a set of four or six machines is simple and effective.

The quantity of stuff which can be jigged in a given period will depend to some extent upon mechanical conditions, but more especially on the size and difference between the density of the ore and its gangue. Ore grains of considerable volume, associated with comparatively light minerals, can be separated almost instantly, whereas if the grains are small, and the matrix of nearly the same specific weight, the one can only be slowly isolated from the other.

For large-grain stuff, from three to ten millimetres in diameter, a differential stroke may in some cases be desirable; but for jigging stuff, from one-quarter to three millimetres size the rate of the stroke may well be constant.

Cams, springs, and other forms of piston-gear are employed in the continental mines, but are being more or less superseded by Kley's differential gear, eccentrics, discs, or rocking-shafts. A detached motion offers no advantage, and is passing out of use. The form, as well as the details, of jiggers have also received such an amount of attention as to leave but scant room for effecting any novel and valuable improvement.

To our countryman, Petherick, may be ascribed the invention of the hydraulic-jigger, and to Hunt the introduction of continuous jigging; but in Germany, Von Rittinger, Von Sparre, Hundt, Osterspey, Neuerbourg, Utsch, Hardt, Hoffmann, Braun, and many others have devoted their time and talents to the construction and improvement of dressing apparatus; whilst in France, Huet and Geyler have devised excellent jigging-machines; and in South Australia, Messrs. Hancock and Painter have advantageously modified the usual form of the apparatus. JOHN DARLINGTON.

2, *Coleman-street-buildings.*

QUICKSILVER.

The long-prevailing high price of quicksilver has exercised an important influence on our mining interests, and the importance of obtaining it at low rates will be evident to all, except producers. In the production of gold and silver bullion quicksilver is an indispensable requisite, and without it our mines could not be developed, unless the ingenuity of our people could devise some suitable substitute not now known. The production of this necessary article at the cheapest possible rate is a matter of great interest to our mining population, and the many mines of this metal in California, by proper and economical working, with suitable appliances, and without combinations to keep up rates, should be able to produce and sell it at a much more reasonable price than present quotations. A low price for quicksilver would cause an increase in consumption, and of course, larger sales, requiring a greater production. It is an absolute necessity for the purposes for which it is mainly used, and for amalgamating particularly, where it is now used with a sparing hand, a more plentiful supply would be a material benefit.

THE EUROPEAN MINES.

The amount of quicksilver which the various mines of the world are capable of producing is very large, much larger, in fact, than is demanded for any purposes to which it is at present applied, and the only reason why it is held so high is that a few parties have control of the supply of the world. The Almaden Mine, in Spain, discovered in 1497, yielded for 250 years from 550,000 to 650,000 lbs. per annum. In 1750, when the Huancavelica Mine of Peru caved in and the supply from that source was temporarily cut off, the Almaden increased its production to about 2,016,000 lbs. per annum, and has continued to yield that amount ever since. The Santa Barbara Mine, of Huancavelica, which had up to 1867 produced $80,000,000 worth of quicksilver, is now abandoned. The reasons given are its distance from sea-board, low grade of ores, and scarcity of fuel, being unable from these causes to make any profit in competition with the other great mines of the world. The Idria Mine, in Transylvania, is another of the important mines of the world, and its production is from 600 to 800 flasks per month. The ores are of a low grade. This mine is under lease from the Government.

THE CALIFORNIA MINES.

California, among its numerous mineral advantages, possesses the broadest fields of this necessary article in the world, and by far the most prolific of its mines is the well-known New Almaden, in Santa Clara County. As it may be interesting to know the amount produced from this mine yearly as the representative one of California the following figures will show it, in flasks, premising that the flasks contain 76½ lbs. of quicksilver. In 1851, the number of flasks produced was 23,875; in 1852, 19,921; in 1853, 18,035; in 1854, 26,325; in 1855, 31,860; in 1856, 28,183; in 1857, 26,002; from July 1857 to October 1858, 39,935. From that time to February 1861, the mine was closed by injunction. From February, 1861, to January, 1862, it produced 34,765 flasks; in 1862, 40,391; in 1863, 19,564; in 1864, 46,216; in 1865, 47,194; 1866, 35,150; in 1867, 24,461 flasks; in 1868, 25,628; 1869, 16,898; in 1870, 14,000, and in 1871, 18,763 flasks. Total up to January, 1872, 537,176 flasks, each containing 76½ lbs. of quicksilver.

The New Idria Mine, in Fresno County, produced in 1866, 6045 flasks; in 1867, 11,500; in 1868, 12,300; in 1869, 10,450; in 1870, 10,000, and in 1871, 9227 flasks. The Redington Mine, near Knoxville, Lake County, produced in 1866, 2980 flasks; in 1867, 7145; in 1868, 8700; in 1869, 5000; in 1870, 4546, and in 1871, 2128 flasks.

Among the other mines whose product goes to swell the gross amount are the Guadalupe, in Santa Clara County, owned in Baltimore, Md.; the Josephine, in San Luis Obispo County, owned by Barren and Co.; the Enriquita, owned by the Almaden, and the Bautista, owned by the Almaden, and now idle, both in Santa Clara County; the Pioneer is in Napa County, the Whitton is in Napa County, and there is one at Oakville. The Vallejo Mine is in Solano County; the Manhattan or Knox and Osborne Mine is 3 miles from Knoxville, in Lake County; the California is in Yolo, and there are several in Pope Valley, near Napa; the Abbot Mine is in Lake County; Excelsior in same county. There are several in Monterey, one of which is called the Pennsylvania, which produced a small quantity, and one owned by M'Garrahan not now being worked. There is one at Mount Diablo, Contra Costa County, which produced a small quantity, but is now in litigation. An occasional flask comes from the San Luis Obispo Mines. The Riotte and Lockhart Mine is at St. Helena, Napa County. The Phœnix, in Pope Valley, Napa County, produced in 1870, from a partial working only 763 flasks. There is also a mine in San Bernardino County, and several recent discoveries in Napa and Lake Counties, and a number are spoken of, from which we hear little, in Coast Range, from up north down to San Bernardino County. The total product from all the California mines mentioned for the last three years was, according to the *Commercial Herald*, as follows:—In 1869, 36,600 flasks; in 1870, 29,546 flasks; and in 1871, 31,881 flasks.

The total monthly product at present is said to be not over 3100 flasks, of which the New Almaden furnishes 1600, the Redington 600, the New Idria 600, and all others 300. The New Idria cleaned up 2000 flasks in January, 40 from the mine, and the remainder from what had accumulated inside the condensers.

CAUSE OF THE HIGH PRICE OF QUICKSILVER.

Quicksilver has remained at a high rate for the past three years, and at such a one as the amount of production and demand does not warrant. A combination, or ring, control the whole supply, and keep the prices where they can make the most profit. Through the agency of Mr. Butterworth, the manager of the Almaden, a contract for the delivery of 50,000 flasks from the products of the mine prior to April 1, 1868, was made in 1866 with the late Mr. W. E. Barron for $30 per flask. They obligated themselves not to sell or consign any quicksilver from the mine until the contract entered into was completed. Messrs. D. O. Mills and W. C. Ralston were Mr. Barron's securities for the faithful performance of his part of the contract, which was to advance $150,000 on the debt of $250,000 of the company, and if necessary advance money to meet the full amount. The contracting parties found in April, 1868, that the production exceeded the demand, or rather that while the production was increasing the demand was the same, and declined to contract to purchase any more. However, another contract or agreement was made between Butterworth, representing the New Almaden, Barron and Mills, controling the New Indria, and the owners of the Redington Mine for two years. By the terms of this contract as far as known, these mines were to limit their production to a certain amount, Barron and Co. were to be shipping and foreign agents, Redington and Co. local agents for the sale of the quicksilver here. The product of the mines was reduced, and by the arrangements made the combination netted a profit of about $35 per flask on the sales. The annual report of the New Almaden Company for 1870 states that the financial matters of the mine were in a bad state, and $55,000 was required immediately to settle a lawsuit. There was also a large amount due to the Bank of California. The agent, Mr. Butterworth, to get out of this financial difficulty, entered into contract with D. O. Mills to sell him the 15,525 flasks of quicksilver hitherto delivered to Barron and Co. under combination contract and all that would be delivered up to April, 1870, under said contract at $32 in gold per flask. And all the product

for two years from April, 1870, at $31 gold per flask, half cash on delivery and half cash in 60 days, he discounting all deferred payments at current rates of interest if the company should so require. The company had the right to deliver an average of 2000 flasks of quicksilver monthly. He was to pay the company any sum that might arise after deducting amount due to Barron and Co. for advances on the quicksilver under their contract.

When the combination contract between the New Almaden, New Idria, and the Redington Mines expired the owners of the Redington, knowing that the two other mines were controlled by the same parties, declined to enter into any new combination, or sell their product for the price which the New Almaden did. They finally entered into contract with Barron and Mills to sell their product for 10 years. The price was not made public, but was generally understood to be $40 per flask, and the production was to be limited to a certain amount; Redington and Co., under this agreement, were still to have the local sale.

The Almaden Mine, in Spain, is entirely in the control of the Rothschilds, who have a lease of it. This mine supplies the London market, and a large part of Europe and Mexico. California supplies the United States, China, and India, so the world is divided between the two great producers. An understanding exists between the two controlling parties which permits each to dispose of their quicksilver in their respective markets. The result is that a pound of quicksilver, owing to the duty of 15 per cent., is 15 per cent. dearer in California, where it is produced, than in Mexico, to which place it is exported from Spain.

By referring to the figures given above it will be seen that the product of the several mines has gradually decreased since these combinations were formed. The consumption is, of course, limited, and an over supply would not suit the measures of the men who have control. Moreover, what is consumed would be consumed if it were $1 or $1·50 per lb., just the same as at 85 cents, but small miners could not use it to advantage. The amount lost in amalgamating has been discussed at length in the *Scientific Press*. The Almaden ores just as they come from the mine would not average over 3 per cent. metal, and the Napa Mines not more than 1 per cent., so a good deal of ore is rejected: 3 per cent. ore, however, will pay well, and all of the mines would pay if they chose to sell at lower rates. Some of the mine owners, however, sell their product to the Bank of California combination, while others with small lots traffic with hardware dealers or others who supply parties in the interior. They generally undersell the combination a few cents, but the amounts are so small they make little difference. Although it is understood that the contract of this combination expired on the 1st of April of this year, their profit has been so immense that it is probable that there will be a renewal, and a combination of the various mines and interests will most probably be effected. So far as known at the present time, no such step has yet been taken, but as prices remain as they have for months past, it is to be supposed that we will have no reduction for some time to come. The owners of the Redington purposely keep down their product, because they prefer to keep the ore in the mine rather than sell it at the price agreed under a contract which only compels them to deliver what they manufacture. The only chance we would have to get a decrease in price would be in case a number of the new mines would refuse to enter the combination, and increase their product, but there is little chance of this. The ring have too good a thing of it, and doubtless intend to continue their operations on the old basis. Perhaps we ought, under the circumstances, to congratulate ourselves on being able to get it even at the advanced price we do. Still it seems lamentable that an article which is so indispensable to our mining operations should be subject to a speculative combination, without any conscience, as it depresses the leading industry of the Coast. The miner requiring the use of quicksilver in California is obliged to pay the monopoly price, 85 cents per lb., while a merchant exporting pays but 80 to the same company for the same material.—*Scientific Press* (San Francisco).

FOREIGN MINES.

ST. JOHN DEL REY.—Morro Velho, April 29: Morro Velho Produce: Owing to the small quantity of stone being stamped the produce will in future only be cleared up monthly, and cannot be reported by this mail. This arrangement will save expense.

— May 1: Lowering of Water in the Shafts: During the month of April the water has been lowered in the shafts 14 fms. 4 ft. 8 in., leaving 25 fms. 0 ft. 2 in. more to be pumped out. Rapid progress is being made in re-erecting the Gamba wheel at the new shafts to work a second set of pumps in these shafts.

DON PEDRO.—Extract from letter, dated April 28: Produce to date, 6634 oits; estimate for month, 8634 oits. The force is at present somewhat short of requirement, chiefly owing to the capricious attendance of native labourers.—Mine captain's report, dated April 27: From the 15th inst. to date ore has generally been derived from the same places, with the exception of a few tons for a trial before opening. In the second stoping from Alice's West, from under where No. 4 vein and Canoa in underlie lode was rich, some fair strake work samples have been obtained, but before working operations can safely be commenced here a decision must be concluded as to how and when the hauling shaft or incline plane at the northern part of mine shall be erected. From date to reply the second stoping at this point will remain in abeyance. Box work has been extracted from No. 8 shoot, descending below the adit level. The improvement in lode descending from Bryant's level to this place is most encouraging, and warrants well for extension in depth. No. 1 stope in Canoa still retains its size and auriferous quality. The vein has fluctuated, but has yielded some fair box work. Yesterday ten boxes of vein stuff were extracted, gold visible on taking out, but leaving vein somewhat disordered. This is hoped nothing more than temporary fluctuation. No. 2 stope in Canoa is not so productive. No. 6 stope has given fair general work, but no box work. These stopes require to be taken away with great precaution. The sinking of the No. 6 incline in footwall of lode to the 25 for thorough communication from Alice's to the bottom of mine is resumed. No. 3 rise, samples fluctuating, progress slow, owing to cross-cut not required timber when driven, but shortly after the communication of pass from cross-cut to said rise back and sides crushed and became dangerous, so that immediate timbering was required. This, with tramroad to first pass, is completed.—Bryant's Rise: But little has been done here, as the vertical rise above requires timbering, and three Englishmen sick, with so many important jobs on hand, this place has yielded its force to where considered most requisite. On the 14th inst. samples improved a little. To date little has been done at the level north; at present it is unproductive. Tatto from No. 2 pass, the lode is wide and strong, but of a low standard. We hope in the course of a few days to commence rising to communicate with the north stopes Alice's West. No. 4 rise very hot; lode of a low standard, consequently progress slow. Fair duty has been done in sinking Vivian's shaft, and at the bob-plat. It is now under consideration which is best and least expensive (say, for fifteen years' working) to sink and secure No. 1 incline for hauling and new engine-shafts combined, with timber only, or with first low-price timber, and then masonry—say, bottom and sides stone, with brick arch. No. 2 incline is drained by a tattoo from excavation on No. 6 shoot of lode. Tatto north from Canoa is unproductive; ground hard for driving. The wire-rope has arrived, and is much required; the Mattodas Cobras force is engaged erecting stages and preparing for the fixing of same. The fencing about the entrance to Alice's level is completed, about 500 ft. in all. Exploratory works are limited. Details of mine force distribution will be annexed with monthly report. It may be understood that Brazilians in general like to be moving from place to place, but owing to native and black force having been refused in the early part of the year but few applicants are forthcoming. Works in hand, and to take in hand, not raising produce, and tending to retard explorations with present force, are—Reprieving and re-opening water level; reprieving adit level; to open Symons's rise for ventilation or hauling shaft; to reprieve Alice's straight level and repair tramroad; to reprieve and repair No. 6 and No. 8 incline, for proper thoroughfare of mine; to timber and lay down tramroad at No. 1 cross-cut, from the now first pass to present end; to timber down shaft about 4 fms. from No. 4 gully, to Bryant's rise on course of lode; to fix sets in vicinity of No. 3 rise; to reprieve and repair Bryant's cross-cut; to rise against No. 1 incline; to re-fill No. 8 stopes; to prepare and fix wire-rope; exclusive of the sinking of Vivian's shaft and the No. 1 incline, with engine-shaft, and also the sinking of the No. 2 and No. 6 inclines for proper thoroughfare and ventilation of mine. There are still hauling shafts to be opened up, and preparations to be made for permanent pumping machinery, in addition to coming work.

Telegram from Lisbon: Produce for April, 8994 oits.; weighed to May 18, 2804 oits.

TAQUARIL.—Captain Martin, April 29: General Remarks: There is no new feature in the mine to call for special remark since my last advice. The works generally are going on satisfactorily. The sand at the stamps is of low standard, which is being derived from stuff above the 15 fm. level and a little stoping on No. 1 lode.—Mine: In the 25 fm. level, west of junction, the lode is composed of clay-slate and iron, with a line of jacotinga close to the hanging wall, but is unproductive at present. At the same horizon east of Haymen's shaft, on No. 1 lode, the progress has been retarded in consequence of an increase of water issuing from the manganese, which necessitates the hanging wall to be secured with strong timber some distance behind the end. In the 18 west we are cutting through the No. 1 lode near the junction, which consists of iron, felspar, and sandstone. In the 15 fm. level cross-cut, north from old workings, no lode intersected to date. The end is still in hard sandstone. The same remark applies to the adit cross-cut, north of old workings. We are prosecuting a vigorous search in old workings above the 15 fm. level on No. 2 lode. The excavation made by the former workers seems very irregular, varying from 2 to 4 fms. in length. We are carefully sampling each end, as well as the sandstone in the footwall, but to date nothing worthy of note has been met with. In the exploratory works near the stamping-mill, and in the jacotinga mountain west, there is nothing new to comment on; the former occasionally shows a little gold.

SAO VICENTE.—Extract from letter dated April 28: Bucutu: I have much pleasure in informing you that the works throughout the mine are progressing well.—Viscount's Shaft: In this shaft we continue to make good progress. During the past fortnight we have sunk through a layer of ferruginous sandstone, about 4 ft. thick. We are again sinking through jacotinga, which is slightly auriferous, and at no time since the shaft was commenced has the ground appeared more favourable for the production of gold. We are 198 ft. deep, but still without water.—Bernard's Adit: We are still making fair progress here. We have just reached a point where the level has crushed in from the surface, which renders it a little more difficult for driving, but nothing more than experienced hands can handle with ease.—No. 1 Level: Here we have commenced driving on the line, which is at present very small, and not rich; but still it will give a little gold when sampled in the batea, and judging from the general appearance of the ground I believe we shall come upon a payable shoot of gold within a month or two.—No. 2 Level: The ground in this level is now difficult for driving with Brazilians, and as I have no Englishmen to put there at present we are not going ahead as fast as I could wish.—No. 3 Level is still in a hard bar of ground, and is without any change since my last report.—Deep Adit: Here we have driven only 20 ft. during the month. The ground at present is very treacherous, but I am using every endeavour to make the work perfectly secure, so as not to be obliged to abandon it at any time, or go over it again. The whole body of the stuff through which we are now driving shows gold in the batea. As soon as the stamps is in order I intend passing a few hundred tons of this stuff through at once, to see if it will pay. There are tens of thousands of tons of this stuff here, so that if it will pay to stamp the mine may be in a paying position sooner than I anticipated.—Water-courses: The water courses are getting on very well, and will soon be completed.—Stamps, &c.: The stamps will be at work in a fortnight. We are getting on with Canoa and the necessary boxes, &c., as fast as possible.—Sao Vicente: Morro das Almas: Slow progress has been made in sinking the ground, being very hard; however, we must persevere with it if we wish to open the mine.—Prospecting: The big body of quartz referred to in my last appears to be going down very strong, but in appearance it is much the same as when I reported on it; I do not expect much change in it until we are down 8 or 10 fms., although there may be a change sooner. I do not like being too sanguine, but my opinion is it will turn out well.—Regos: The big rego being so much out of repair, I have been compelled to put a large force on it, in order to get sufficient water to work the stamps, so that other places have been thrown back in consequence. We have 250 oitavas of gold, which, with more we shall take out, will be forwarded at the first opportunity. Everything appears to be going on satisfactorily, and the health of the establishment is very good.

ROSSA GRANDE.—Extract from letter dated April 28: General Remarks: The expectations held out in my annual report, under date January 28, respecting the Bahu Mine I am glad to say, from what I have since seen of this section of the property, were well founded. It will be remembered that I stated that six months would then be required to fairly lay the mine open, and with this single, exception that the progress made towards effecting a communication with Dinne's shaft, has been somewhat less speedy than I hoped, the results have been quite equal to my anticipations. Although as yet we have not proved the lode west of sump-shaft, to be richer than that sunk through, I have seen sufficient from samples taken to be safe in stating to you that before the expiry of the time above-mentioned we shall have good stopes open in this direction. The erection of a 12 head-stamps on the spot is indispensable to treat the ore that will shortly become available and I recommend that the same be commenced forthwith. The size of the lode in the Cachoeira Mine, as far as we have opened on it, although of lower quality than Mina da Serra, will admit of a quantity being sent to stamps that will more than compensate for the lesser yield. I have, therefore, good reasons to believe that towards the end of June next we shall be in a position to exhibit some profit on the working of the mines, and you may depend no efforts shall be wanting on my part to obtain this desirable end.—Mine Report: Bahu Sump Shaft: The lode in the bottom is opening out westward. This is of great importance, as the main body of auriferous lode worked on by the former proprietors lies in this direction, and, seeing at this point—which is 9 fms. deeper than any of the old workings—that the lode is strong, well defined, and of good quality, is a very satisfactory feature; it is now 2 ft. 6 in. wide, discharging a great quantity of water, with every indication of opening out wider as we advance westward. Since my last report we have commenced a level on the course of the lode in the Sump shaft, called the 18 fm. level west. The lode in our stopes in the bottom of the 10 fm. level east and west, considering as yet it is little opened on, is looking very well.—Cachoeira: Owing to our having to commence the 10 fm. level east so close to the bottom of Richard's shaft, very little has been sunk since my last report, and the lode is without change to notice. In the 10 fm. level east the lode is fully 2 ft. 6 in. wide; this level is being forced on with all possible speed. By the end of the month we shall have advanced over 6 fms. The lode in the winze east of Richard's shaft has a very favourable appearance at present, 3 ft. 6 in. wide, producing fair stamping work. No change in the character or quality of the lode in the adit end since my last. No. 2 cross-cut is progressing slowly.

ANGLO-BRAZILIAN.—Extract from letter dated April 29: Reduction Officer: Mr. Wendeborn reached here on the 20th, and is now busily engaged in making the required experiments. By the next English mail I trust to be able to inform you of some of the results.—Passagem: General Remarks: Cost continues high, the charges for exploratory works and experiments for the better separation of the gold being still very heavy. Wilde's stamps, partly refitted for deeper stamping, are being used exclusively for experiments with the pyritious ores from Dawson's and Foster's bottoms. The building of a small laboratory furnace is also in course, by which the various results can be checked chemically.—Barril: Tramway and shoot quite finished, and raisings from that quarter will be commenced at once. The other sections of the mine remain unchanged, produce about the same as last month, and force very scarce.—Pitangui: Vertical Shaft, Franco-Antonio Line: Since last report not much progress has been made, the influx of water from the incline and other places being somewhat more than was expected. This has been partly overcome, and will not cause for some time yet, it is hoped, any very serious delay. The samples from the bottom of the shaft are stronger and stronger for gold. Measures in the next few days will be taken for the cutting of a plat in the direction of the incline before finally effecting a communication, the horizontal distance between the two being 2 fms.—Hosken's Level: The hard course of conglomorate has been passed, and we are now contending again with a soft channel of ground.

GENERAL BRAZILIAN.—Extract from letter dated April 28: Produce: The produce since last advised 52 oits., and derived from stamping 30 tons of debris from the old adit.—St. Anna: At Itabira the produce is not yet cleaned up.—General Operations: St. Anna: The shallow adit (No. 1) has little or no alteration since we last advised.—Itabira: The shallow adit is advancing fairly; the ground much improved. At Souza's vein no change has taken place. No. 3 cross-cut progresses satisfactorily. All other points are under suspension. The health of the establishment is good, and provisions again plentiful.

ECLIPSE.—Capt. Jones, May 18: Mine: We have removed all the debris from the incline-tramway and dump thrown down by the late earthquake, have rebuilt blacksmiths' shop and repaired whim, underground tramway, &c., and on Monday next we shall commence to break ore, hoist, &c.—Mill: We shall complete repairs and alterations during the present week. We have completed watercourse from river to mill, tail-brace from mill to river will be completed in a few days. The 3 miles of tramway from mine to mill will give us considerable trouble, but on Monday next all our available force will be brought to bear on this work and hurried on to completion. In conclusion, I hope we shall be able to start up our mill on or about June 1. Every effort will be made to attain this, after which I am quite confident profitable returns will be made.

MAMMOTH COPPEROPOLIS OF UTAH.—F. Fowler, Salt Lake City, May 19: I am happy to say I have a fine report to give you in regard to the mine. I returned from Tintic on the 16th; on this visit I found the development of the property remarkable. Our foreman called my attention to a large formation of quartz, mixed with copper ore, in the south hill towards the south end of our mine; here I have opened a very wide lode, containing a considerable amount of first-class copper ore and quartz. On examination of the material we discovered indications of silver, and I at once collected some samples, and brought them with me to Sandy to be assayed, and was astonished at the result, the assay giving as follows:—$72, $104, $20, and $132 of silver; and one gave a result of $50 of silver and 5 ozs. of gold, or $100 in gold, with the silver to the ton of quartz. This, within a few feet of the surface, is really remarkable, and I feel sure we have an immense amount of this quartz, and that this, combined with the copper, and with what follows, will make this one of the grandest mines in America. Besides this, I have to report a discovery of fine malachite. We have already taken out 200 or 300 lbs., a small block of which I have brought with me into town to be polished by a jeweller, which I will send to you by express that you may ascertain its value in London. I think we shall discover quantities of this beautiful and valuable material. There is now 152 tons of ore at Sandy, about 40 tons first-class—in fact, it should be all so designated, it being all such good material. I am arranging to send it off *via* San Francisco and New York.

LUSITANIAN.—June 4: Palhal: In Taylor's engine-shaft, below the 150, the lode has been taken down, and is worth 3 tons of ore per fathom.—Levels on Basto's Lode: In the 150, east of Taylor's, the lode is 4 ft. wide, composed of quartz and stones of ore. The rise above the 150 has been holed to winze No. 91. The lode in the western end of the 150 fm. level yields ½ ton of ore per fathom. In the 140 east the lode is 6 ft. wide, composed of loose quartz and runners of country. In the 130 east the lode is 8 ft. wide; and in the 120, east of River shaft, 4 ft. wide, composed of quartz. In the 110, east of this shaft, the lode is 2½ ft. wide, made up of schist and a branch of soft mundic; and in the 90 east 2 ft. wide, composed of soft gneis and quartz. The lode in the 80, east of winze No. 89, is 1½ ft. wide, and worth 1½ ton per fathom; and in the same level west, 4 ft. wide, worth about ½ ton per fathom. In the 70, east of River shaft, the lode is 5 ft. wide, containing stones of ore. In the adit level, west of Perez' shaft, the lode is 2 in. wide, poor. The lode has not yet been met with in the 38, west of the slide lode.—Levels on Slide Lode: In the 140, south-west of Taylor's, the lode is 1 ft. wide, composed of a dry flookan. The south-west is suspended for the present, and the men put to drive west on a small branch. The lode is very small in the 130, west of Slide lode, but at times has spots of copper ore and mundic. In the 130, north-east of Taylor's, the lode is 1 ft. wide, composed of flookan. The ground in the 18 cross-cut, west of Perez' shaft, is favourable; we have cut a branch here, but it is poor; we shall drive a few feet more.—Carvalhal: In the 60 cross-cut, north of incline-shaft, the ground is a hard gneiss, and getting a little wetter. In the same cross-cut south the ground is not very hard, but rather wet.—Great Lode: In the 60, east of incline-shaft, the lode is from 6 to 8 in. wide, composed of quartz. In the 50 east the lode is 1 ft. wide, yielding stones of lead; and in the 50 west 1½ ft. wide, of the same character. In the 40 east the lode is worth nearly ½ ton of lead per fathom. The lode in the 40 west is 2 ft. wide, composed of quartz and mundic, with spots of lead. In the 30 and 20 east the lode is made up entirely of quartz. The flookan lode in the adit, west of incline-shaft, is 1 ft. wide, of no value.—Caunter lode in the 10 fathom level, west of incline-shaft, is 6 in. wide, composed of quartz; in the 20 the lode is 1 ft. wide, yielding ½ ton of lead ore per fathom, and in the 30 west 1½ ft. wide, also worth ½ ton per fathom.

WEST CANADA.—May 23: Wellington: The stope in the bottom of the 40 east of Rowe's shaft will yield 2¾ tons per fathom. The stope in the bottom of this level, west of the shaft, has not been set from want of miners.—Huron Copper Bay: In Bray's shaft, sinking below the 60, the lode looks very promising, and will yield 1½ ton of ore per fathom. The 50 fm. level is being driven by two men, and, as the lode shows some promising indications, we intend to let the men work on for another week. A stope in the back of the 60, east of Bray's, will yield 2½ per fathom. The stope in the bottom of the 50, west of Palmer's shaft, also yields 2½ tons of ore per fathom; in the bottom of this stope, near the 60 fm. level, the lode becomes poor. A stope in the bottom of the 35, west of this shaft, is now being worked by six men, who have lately been putting in timber; the lode yields 3 tons per fathom. Two stopes in the bottom of the 35, east of Bray's shaft, will yield 2½ and 3 tons per fathom; and one stope, west of Bray's, on Fire lode, 2¼ tons per fathom. The stope in the bottom of the 20, east of new engine-shaft, also produces 2½ tons per fathom.

PESTARENA UNITED.—Thomas Roberts: Returns from Val Toppa district for May, 253 ozs. 4 dwts. 19 grs. of gold, from 628 tons ore: from Pestarena, 32 ozs. 17 dwts. 18 grs. of gold, from 42 tons ore: total, 286 ozs. 2 dwts. 13 qrs., from 670 tons of ore. Owing to the great floods the machinery was idle for 2½ days, so that the water-courses might be cleared of the gravel brought down by the Auza.—Val Toppa: End south on side lode in Zero level, yield 3 tons per fathom, worth 15 dwts. per ton. During past month a new cross-cut (No. 3) has been started to drive west from Zero level to cut the side lode further in the mountain. No. 1 level, end south on new lode, yields 10 tons per fathom, at 10 dwts. per ton. The stopes in the back of this level, south of cross-cut, yield 9 tons per fathom, at 15 dwts. per ton; and north of cross-cut, 10 tons, at 7 dwts. End south, on the western part of quartz lode, 9 tons, at 8 dwts.; and stopes in the bottom, 10 tons, at 9 dwts. No. 2 level, end north of cross-cut, on the eastern part of great quartz lode, is poor, and suspended. We have resumed driving end north on the western part of quartz lode. Stopes in the bottom, north and south of winze, on new lode, yield each 12 tons per fathom, at 9 dwts. No. 3 stopes in the back on this lode, south of No. 1 cross-cut, 10 tons, at 7 dwts. Intermediate end south, under No. 2 level, 14 tons, at 8 dwts.; and north, 10 tons, at 6 dwts. The stopes in the back of No. 3 level, 9 tons, at 8 dwts.; and rise on this lode, 6 tons, at 9 dwts. per ton. The end driving south in the mountain gives 8 tons, at 7 dwts. In No. 4 level we have resumed driving south in the mountain, on the so-called slide, with a hope to make a discovery, and have commenced a new drive on a side lode, south of first cross-cut east.—Pestarena: After suspension of stopes, the 33 end on No. 5 lode, in Peschiera, has been driven through a small shoot of ore, 3 fms. long, of 3 tons per fathom, at 15 dwts. per ton; the end showing at present 2 tons per fathom. The end north in this level, on No. 2 lode, is now 15 metres north of so-called cross-course, and the ground of a more favourable nature, and yields 4 tons per fathom. We hope this increase of ore is the commencement of that gone down in the boundary stope under the 20. After clearing up and securing the 55 end north, 11 metres have been driven in new ground, lode small, but larger in the end, giving 4 tons per fathom, at 12 dwts. per ton. This end also is getting near a more productive run of ground. The 46 end south is now 21 metres from the level on slide, and is on a small lode, pointing towards the old Pozzone Mine. A short time before suspending we struck a joint in the western ground, letting out water, charged with iron freely, which is probably coming from a wider lode in advance of the end.—Aequavivo: The 23 end south has since the ends were suspended been driven 25 metres, going through a shoot of ore, 4 fms. long, giving 6 tons per fathom, at 8 dwts. per ton; the end of this level is poor at present. The end of the 23 level north has been driven 18 metres, the greater part giving 2 tons per fathom, at 10 dwts., but the end is more promising, yielding at the rate of tons per fathom, at 12 dwts. of gold per ton for amalgamation. A stone from this discovery assayed 4 ozs. per ton. The ore reached is, no doubt, the commencement of the course of ore worked on in the old shallow levels. The 33 end north is poor; the 33 south driven 21 metres, 12 of which went through a lode yielding 6 tons per fathom, at 10 dwts. Very little work has been done in the 46 end south, but it shows 1½ ton per fathom, at 1 oz. per ton, and is near the line of rich ore ground, gone down in the 33 fm. level. The whim-shaft completed to 46 fm. level, and good progress is being made in carrying it down. We estimate two months work to the 55 fm. level.

[For remainder of Foreign Mines see First Supplemental Sheet.]

AUSTRALIAN MINES.

YUDANAMUTANA.—The superintendent (Adelaide, April 24) states—The timbering of the engine-shaft is at last complete. The engine and pumps were put to the test on the 10th instant, and are a great success. The water was forked in a few hours, and Hill's lode uncovered. Capt. Terrell has decided upon sinking on and proving this lode immediately. The north end at the 55, the stopes at the 50, the new branch at the 40, and the stopes at the 10 and 35 are all yielding well, and mill keepers fully supplied with ore for the whole of our furnaces when in working order. Wood has been coming in but slowly; but when the rain sets in, and feed becomes more abundant, a larger number of carters will be on the place. The falling off in the smelting returns was owing to two of the furnaces being out for repair. Mr. Martin left Adelaide on April 3, *en route* for England, *via* Panama. Capt. Terrell reports, under date April 15, Blinman Mine: North End, 55 fm. level: This lode is still looking promising—the ground is not so hard as when I last wrote. The stopes above the 50 fm. level bear a richer appearance. The branch of ore south of Hill's lode, at the 40 fm. level, has turned out some good ore. I shall push on sinking the engine-shaft as soon as possible, in order to get in work on Hill's lode. Copper made, 22 tons.

PORT PHILLIP.—Clunes, April 20: The quantity of quartz crushed during the four weeks ending March 26 was 5406 tons; pyrites treated, 48 tons; total gold obtained, 1329 ozs. 1 dwt., or an average per ton of 4 dwts. 22 grs. The receipts were 5062*l.* 9s. 6d. Payments: Ordinary, 3485*l.* 18s. 5d.; on firewood and timber account, 896*l.*; on new plant account, 561*l.*: total, 4942*l.* 18s. 5d. Profit, 119*l.* 11s. 1d.; deducted from which was last month's debit balance of 2*l.* 2s. 6d., leaving an available balance of 117*l.* 8s. 9d., which was carried forward to next month's account. The average yield for the two weeks ending April 9 was 3 dwts. 2½ grs.; third week, ending April 16, 3 dwts. 10 grs.

Telegram, dated Galle, June 12, in anticipation of the mail leaving Melbourne, May 22, and due here on July 8: Month ending April 23: yield per ton, 3 dwts. 22 grs.; fortnight ending May 7, yield per ton, 4 dwts. 5 grs.

ANGLO-AUSTRALIAN.—Capt. Raisbeck, April 23: "I have the honour to report progress since March 28. No. 1 engine-shaft east has been sunk 7 ft.; the eastern cross-cut at the 198 ft. level is driven 6 ft., and a cistern plat at the north end of shaft 16 by 8 ft., cut out; the present depth of shaft, 207 ft.—No. 2 Engine-Shaft West: The western cross-cut, at the 220 ft. level, has been driven 13 ft.; total length from shaft, 30 ft.; country hard. We are cutting down near end of shaft preparatory to placing in the nine lifts.—South Shaft (same line as No. 2 engine-shaft): As the water is not drained in the bottom cross-cut we have commenced to drive at the 50 ft. level, north and south, on the course of the lode with a reef 6 ft. wide at the south end; stone looks well. In clearing out some of the old workings we have come upon a fine-looking spur from 12 to 18 in. thick, as the spurs immediately above this have yielded above 2 ozs. per ton, it is very probable that this will prove equally good. There will be a large amount of stone ready for the battery from the south end of the claim (open cutting). The tailings dam will be completed in two or three days. Several old shafts have been lately cleared out, and in all these there have been found several gold-bearing spurs, which have been worked to great profit in olden days at a higher level." Mr. Kitto writes—"It is impossible to estimate the quantity and value of the quartz we have discovered ready for raising. We have many thousand tons in sight, which, judging from the few trials made by us, and the tens of thousands of tons crushed by our predecessors, should yield 6 to 8 dwts. to the ton. The tracing sent you on Jan. 2, 1871, shows the position of the main shafts. These will be the principal points from which the mine will be worked some years hence, and at present are the principal expense. There are, however, on the ground scores of small shafts by former workers, and in two or three places open cuttings. From these points (unavailable for future extensive workings) we shall obtain the principal supply of quartz for a year or two to come. Both Mr. Lamb and myself have thought it unadvisable to raise large quantities of quartz to grass pending the erection of proper winding-gear. The rich quartz driven through in the south shaft is still in the ground, ready to be taken away when the battery is ready. What quantity of this there may be I cannot tell, but what there is is too rich to be about on the surface of the ground unprotected. A large detail plan is being made, and will be finished, I hope, in a month. The little shafts referred to by Capt. Raisbeck in his report are old ones sunk by former proprietors very many years ago. The battery will be at work in a fortnight."

ENGLISH AND AUSTRALIAN.—Port Adelaide, April 24: The quantity of coal at Port Adelaide was about 642 tons. There were three furnaces at work smelting, three roasting, and one refinery at Port Adelaide. Since date of last advices about 125 tons 5 cwts. of copper had been shipped.

YORKE PENINSULA.—The directors have advices from the Committee of Inspection at Adelaide, dated April 22, with reports from the Kurilla Mine to the same date. The following are extracts from Capt. Anthony's report:—"Since my monthly report, dated March 26, I have driven the 15 fm. level west of Deeble's shaft 4 fms. 6 in. The lode holds its size pretty well, and has produced rich stones of grey sulphuret of copper for most of the distance. In the 25 fm. level, west of Deeble's, the lode has been put up 1 fm. 5 ft. 6 in. The lode has much improved, and will now yield ore to the value of about 15*l.* to the fathom of 6 ft. high and 6 ft. long. There was comparatively no ore to value when I commenced rising."

SCOTTISH AUSTRALIAN.—The directors have advices from Sydney, dated April 20, with reports from the Lambton Colliery to the 12th. The sales of coal for the month of March amounted to 13,413 tons.

AUSTRALIAN UNITED.—Fryerstown, April 23: On the Central Mine Capt. Angove reports as follows:—"Since the date of my appointment as captain of your mine (Nov. 20) work has been vigorously carried on. The engine was got ready to pump on the 29th of the same month; and, although the mine was full of quicksand, and in consequence caused several breakages of the pumping-gear, good progress has been made. We have cleared out the east drive, and repaired it 250 ft., and driven it 40 ft. more, making the total length of the east drive 290 feet. At this point we rose 16 ft. to the wash-dirt, and have driven on it 40 ft. south. The water here is very troublesome, and sometimes drives the men from their work. The prospects obtained show only fine gold, but I hope to meet the main gutter shortly—in a continuation of what we have in the west. The west drive has been cleared about 300 ft., and thoroughly secured. A drive south from the end of this, a distance of 110 ft. At 70 ft. we struck the main gutter, and have driven across it 40 ft. We have commenced to drive east and west along the gutter. The wash-dirt is 3 ft. thick, and gold is visible throughout. Two machines have been worked, yielding nearly 140*l.* worth of gold from 260 trucks, or about 11s. worth per truck. One prospect gave 3 ozs. to the tin dish. I consider the prospects of the mine are very good, and I believe you have a very valuable property. I may say that this is the richest gutter ever struck in this district—it even exceeds those of Ballarat. I worked in the Ballarat alluvial mines for some years, and I can say that this gutter is far richer than any I ever saw before, and I have not the slightest doubt but that it will soon make a profit. I am opinion that this gutter will be soon struck in the eastern part of the mine." Mr. Kitto also writes:—"Capt. Angove's report speaks for itself. I can only say, however, in addition to what he has stated, that if the gutter continue as it now is for two years all our losses will be redeemed. Should we fail, it will, unfortunately, not be the first mining failure; but the shareholders will, at any rate, have the satisfaction—poor one, indeed, through it is—of knowing that few mines have been so tenaciously stuck to."

MINERAL WEALTH OF THE PACIFIC COAST.—The Orcutt Mine, Tuolumne County, has struck a very rich stratum of rock, which prospects at through at the rate of $42 per ton, choice picked rock even prospecting as high as $500. A few days ago they took out and washed in one pan 50 ozs. The mines at Sucker Flat are the wonder of all, as the richest gravel mines in the world. It costs enormously to open these claims, as they have to run a tunnel at least 2900 ft. to get their flume through. All their tailings are dumped into the Yuba river. They generally wash from 40 to 125 days before they clean up, and then the result is something short of $100,000. Last season Marks and Co., of Moore's Flat, purchased a gravel claim and two ditches, known as the Brandy City claims, for which they paid $72,000; the claims were immediately put in good order, and 60 days after commencement of work this company cleaned up the nice little sum of $32,500. In the Alhambra Mine, Placer County, at a depth of 40 ft., the ledge is 3 ft. 8 in. thick, at which point the last crushing of rock paid $43 per ton. Work in the extensive mines of Contra Costa County has never been prosecuted with more energy than during the past eight or nine months, and the coal shipments from the Black Diamond alone, besides those from the Pittsburg, Union, Eureka, and Central, have been about 10,000 tons per month, and the pay roll of that company at the mines for the month of April was $26,000. In the Cedarburg claims, El Dorado, they have found some of the richest ore ever unearthed in any of that far-famed locality in rich strikes. The Pocahontas Company at Logtown, El Dorado, cleaned up, after a ten days' run, the snug little sum of $17,600. A placer gold mine has been found in Los Angeles city. The gravel pays 5 cents. to the pan. The Kennedy Mine has clean up resulted in a gold brick of the value of $9000, the rock being worth an average of $18 per ton. It is reported that the Betterton Mine, near Mohawk Valley, Plumas county, has been sold to San Francisco capitalists for the sum of $25,000. It is the current rumour also that the Hungarian Hill Mining Company have disposed of their claims at that place for $50,000 to San Francisco capitalists.

The Gwin Mine, the property of ex-senator Gwin and family, in Lower Rich Gulch, is one of the most extensive and complete mining establishments on the Pacific Coast. The milling capacity consists of 70 heavy stamps, which, when in full operation, reduce from 120 to 140 tons of ore daily. Attached to the mills are pans through which the tailings and sulphurets are passed, and below the pans the sulphurets are concentrated, roasted, and subjected to the chlorination process. There are two main shafts and hoisting works, with each an auxiliary shaft, one 500 and the other 350 ft. deep. A central shaft between these two is being sunk, on a most gigantic scale, it having three compartments, each 6 ft. square. With the exception of an engine at one of the hoisting works, this great establishment is worked by water-power. The fall at the upper mills is 300, and at the lower mills 350 ft. The mills, with the hoisting works at the north mine, are run with hurdy-gurdy water-wheels, while the pans and amalgamators are run by a turbine wheel (Swain's patent). There are about 50 buildings on the property, with a lodging capacity for 150 operatives. The mine extends 4000 ft. on the great mother lode, 1300 of which have been thoroughly prospected, developing 1100 ft. of solid quartz ledge, varying from 6 to 20 ft. in thickness, with three pay chimneys. The mine has been recently incorporated at $2,000,000, and unlike the thousand new mines lately incorporated, is worth every dollar named in the incorporation.—*San Francisco News Letter*, May 18.

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